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ARCHÆOLOGICAL SURVEY

OF

BENGAL

REPORT
1887.

BY

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ARCHÆOLOGICAL SURVEYOR, BENGAL.

(8)

PART I.

HISTORY AND TRADITION.

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(Pts 1&2)

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collected and actually drawn. Meanwhile I have busied myself, thinking out the rules which appeared to have regulated the dispositions, and proportions, of such buildings, as I had materials enough to reason upon.

A subsequent resolution of Government (Home Depertment No. $\frac{}{95-113}$ of 15th March 1886) has in some respects altered my status; and it may possibly render necessary, an unwished for change in my programme. But as the material for this Report was collected, when I excercised my independence of judgement, it will follow on the original lines. This second part of the Report must necessarily take some time longer to prepare, and will be submitted with the drawings as they reach completion.

It will be for the Government to judge, after the *Second* part is in their hands, whether, in acting in this manner, I did not adopt really, the course, calculated to secure results of professional value, in contradistinction to the art-citique method of dealing with the subject; which, however charming in the hands of a master, contains little of value to the professional Architect. Government can command the opinions of many professional Engineers and Architects, my seniors in service, and my superiors in professional ability, competent to sit in judgement on my work; whose verdict would carry weight with me, as with the professional brotherhood in Europe. I earnestly trust, that I may be permitted to pursue the course I had sketched out for myself; the adoption of which I feel convinced, will afford the best return for the money spent in the Bengal survey.

I append a list, showing the material on hand, which is being worked up into professionally complete drawings; from which Government will, I hope, perceive, that it is not want of application that causes the delay, but the profusion of technically accurate and complete drawings which must be made before they can be written about, that has caused the delay.

In my arrangement of the report now being submitted; I have adopted as my basis, the recently published "list of the ancient monuments of Bengal" by the Bengal Government: the information about each object, being, as far as possible, kept distinct; so as to admit of future reports being incorporated with it, by simply inserting the accounts of the objects not mentioned in this report, in their proper places, in their proper sequence, as they gradually undergo examination: and as I hope, if the programme of the ensuing season's operations be approved of, to finish the examination of certain districts; the reports, when that for the ensuing season will have been sent, will he complete as regards those districts, and may if thought disirable be published; leaving the other districts partially examined, to be gradually completed, by incorporating future reports as they come in, before publication; thus publishing, not incomplete accounts, but complete accounts of the antiquities, district by district; one will thus he able to obtain all the information available regarding any one district, without turning over a dozen volumes. But this is a matter which is beyond my province to do more than offer respectful suggestions on; and as such, I beg they may meet with some indulgence.

A few words regarding the work of the two field seasons will not be out of place, as shewing how it is that the drawings are not yet sufficiently completed to write about. Besides the report now being submitted, and

Mr. Garrick's report for last year already submitted; the Bengal Branch of the Survey has yet to submit.

(1) Mr. Garrick's report for the last field season.

(2) My technical or the 2nd part of my report for the past two seasons which will be accompanied, (and as Government will perceive when it is sent that it cannot in fact be written without) by the following drawings more or less.

86 plates to illustrate the Superb Adina Majid: of these there are approximately.

	3	Plates octuple quarto equal to	24	Quarto plates.
	2	Sextuple quarto „ ...	12	„
	3	Quadruple „ ...	12	„
	1	Triple „ ...	3	„
about	17	Double „ ...	34	„
	60	Single „ ...	60	„
Total	86	plates equal to ...	145	Quarto plates.
	37	plates to illustrate the tombs of Sher Shah and of Hasan Khan at Sasseram; equivalent to about	70	Quarto plates.
About	40	plates to illustrate the remains at Rohtasgarh, equivalent to about	55	Quarto plates.
About	30	plates of Temples at Konch, Umga, Maner, Sultanganj Patna, Shamshernagar, and some minor ones; equivalent to ...	50	Quarto plates.
Making		a total of 193 drawings, representing in amount of work approximately	320	Quarto plates.

several of very intricate and laborious kind, and of which only about 15 are photographs.

I trust the Government will, with this information before them, understand how it is, that the drawings and the technical report thereon dependant, are not yet ready.

In conclusion, I invite the attention of Government to the "Notices of Sanskrit MSS. Vol. I. published by order of the Government of India. The work has a classified index at the end, which is very significant. The entire body of Sanskrit works in the possession of, or known to, the Government of India, available for classification and record; at least in Northern. India; is there classified under 19 heads, and the learned world has actually to learn, that, out of 1109 distinct works commented on in these comprehensive "Notices", there is absolutely not a single work on Silpa Sastra (Architecture)! It is not as though Silpa Sastra, did not come within the cognisance of the learned commentator Dr. Rajenda Lala Mittra. Silpa Sastra is in his index placed as the eleventh XI of the very comprehensive classification; but is deliberately and unavoidably left a blank (see page 320 321) notices, of Sanskrit MSS. Vol. I.

But the art exists crystallized in stone, if not laid down in ink on paper; and if not all, at least a fairly presentable portion of the law of the great art of Indian Silpa Sastra (architecture) is recoverable, by competent experts, from yet living, though sadly decaying examples. No amount of art criticism, by whomsoever written can ever compensate for the absence of these laws: and yet these laws exist preserved—nay petrified I should say, in stone and brick, though daily disappearing, (for to my individual and personal knowledge, 4 important buildings, one absolutely unreplaceable, have disappeared during the past 20 years). I have set myself the task of recovering these laws. Of my success or failure TIME and the professional ARCHITECT can alone be the judge. Will the Government which spends money with a lavish hand on so many other objects, constrain the art of Indian Silpa Sastra to continue petrified and lifeless? Sir Alexander Cunningham in his work on the "Aryan Order of Architecture" and Ram Raz in his work on Indian Architecture, (both works now rare) have attempted to lift a very small corner of the veil, I a professional Engineer and an humble disciple of Cunningham, see the want, feel the want—and passionately and humbly crave to lift a further portion of the Stony Veil; not through vanity, but in despair, because no one else has attempted or seems inclined to attempt it. Will the Government tie my hands and compel me to take up the role of the dilettante art critic?

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BARDWAN DIVISION.

The places visited, referring to their numbers in the printed Bengal list of 1886 are 24 and 37, and besides these, are several others, which are not in the list, but which have been numbered 59, 60, 61, 62 and 63 in continuation of the numbers in the list.

Culna or Kalna, where objects Nos. 24, 37 59, 60 61 and 62 are situated is an old city but of no great importance; it existed in the days of Clive, which is the earliest historical mention I can find of it, besides the incidental mention in Chaitanyas' carreer at the beginning of the 16th century: it was here that Mr. Watts escaping from Murshidabad on the eve of Serajuddaulas hostilities with Mir Jaffier and the English, met the British army which Clive had marched up, and urged the necessity of hastening operations. At present, such importance as it possesses, is due partly to its being the headquarters of one of the administrative subdivisions of the Bardwan Division, and partly to its being the site of the Mausoleums of several (3 Maharajas and 3 Maharanis) successive Maharajas of Bardwan. These Mausoleums grouped together as the new No. 61 of the list, lay of course no claim to any great antiquity, nor are they of much Archœological interest, although, as specimens of Hindu arechitecture, of the 18th and 19th centuries, they are not devoid of some importance in a history of Indian art. Of the remarkable buildings built by the Bardwan Rajas, I would particularly mention a circular inclosure containing 108 small temples, disposed in two rows; with a fine line of the Vakula tree between the rows: the temples are of brick, and small, being of one cell each, and each inshrines a small black stone emblem of Siva; they are each roofed by intersecting vaults, and crowned with a trident: the principal shrine is larger, but not essentially different.

A more interesting though less extensive building is the temple called Laljis Bari, dedicated to Krishna, within the great courtyard called the Samaj Bari. I could only see it from a distance, not being allowed to approach it; it is one of the most favorable specimens of the architecture of the period, and is profusely decorated with sculpture, both figures, and ornamental scroll and medallion work in cut brick: but no discription of it in words can convey such a clear impression of it as photographs, which are very desirable, even if correct plans elevations and sections of it, done to scale, together with reduced copies of the ornamental work, by impressions and by photographs, cannot be obtained. These last are really wanted, for I am aware of no building, which displays in a more favorable light the indigenous art and architecture of the period, in Lower Bengal.

There are three other temples within the inclosure, less imposing and less ornate, though on the same general principles, both in architecture, and in ornamentation, and I hope through the kind influence of a personal friend to secure partial if not full details to scale, of one or more of them. There is a fifth temple of a similar kind, and also belonging to the Bardwan State, outside the inclosure; this is as jealously guarded as those within the courtyard.

The remains of a temple of older date and now built into the "Dalan" of the Bhattacharjyas of Kalna is accessible, and as it is inscribed, its age is perfectly certain—there is however but little ornament about it; drawings shewing its details such as there is, will be found in the 2nd part of the report: it was built about the year 1780 by Pandit Ram Ram Shiddhanti who first settled in Kalna about A. D. 1770 and became the founder of the present family of the Kalna Bhattacharjyas of whom the late Pandit Tara Nath Tarkavachaspati well known by his compilation the "Vachaspatya" (a Sanskrit Encyclopœdia on the lines of, but much fuller than, Raja Radha Kanta Devas "Sabdakalpadruma") was, and Babu Bemala Charan Bhattacharjya the distinguished Dy. Magistrate is a member. But although there is not to my knowledge, historical notice of Kalna previous to Chaitanya, the ruins of several masjids and dargas fully attest its great importance in the 14 or 15 centuries.

The old Masjid and attached dargah, object No. 60 of the new addition to the Bengal list, are near the Mission house on the Guptipara Road: they stood within a cloistered inclosure, the Masjid of course facing east, and the Dargah in a separate inclosed, but attached Court, along the North of the Masjid. The entrance was of stone, and stone steps led up to it; the stones which formed the sill of the original gateway, are themselves taken from some older Hindu Temple though it is possible to tell to what divinity this temple was dedicated from the figure of Vishnu on garud which is still visible on the top sill which is now placed upside down. The road on the side of which the inclosure stands, had however, before the British Government introduced the innovation of looking after and constantly repairing roads, been evidently cut deeply by continuous traffic; as its present surface is so much lower than the sill of the gateway, that its original purpose has been forgotten, and it is now worshipped by Muhammadans and the more ignorant Hindus alike, with ghee, libations of milk, and with dabs of red paint, and as the stone which is granite now black with oil and ghee was once inscribed (No. 212 Bengal list of inscriptions) with some rude Muhammadan characters roughly chiselled and now totally illegible, its sanctity is considered unquestionable: only the upper and lower

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sills now remain, the latter in situ as above narrated, and of course no one ventures to set foot on it, but a passage has been broken through the lower courses of the plinth and foundations of the wall close to the stone sill; from the marks of the setting on the lower sill, it appears the clear breadth of the doorway of which it formed the sill, was 2 feet 4 inches and that the side jambs were of an aggregate width each, of 12½ inches; so that the breadth including the stone side jambs must have been 4 feet 5 inches. It appears not only that the inclosure was was cloistered, but further it appears, that the roadway from the outer gate to the Masjid, was flanked on either side by houses apparently of a later period, and used either as shops or habitations for the serving mullah, they are however now all in ruins, and little beyond the plinths exist.

The Masjid itself is a brick one of 3 openings and 6 domes, the greater number of which have, including all the domes, already fallen in, and the rest is ready to fall; indeed the South end-wall has also partially fallen, and the place is consequently so encumbered with rubbish as to render any attempt at. accurate description in detail or measurement impossible without its removal. An inscription slab numbered 207 in the current years list, and now lying in the courtyard is said to have belonged to it, while a second one numbered 208 belonged to the Dargah. The Masjid must however have been a very fine one, and the remains shew traces of painting but not of encaustic tiles; which is strange; but perhaps all such as were on the surface have been carried away and the rest lie buried under fully 8 feet of rubbish heap. The pendentives of the Masjid deserve mention, they are yet intact on the inner face, and are very elegant, they are square in plan, the square form in plan being obtained by corbelling out; this is then vaulted over, thus forming the square chamber into an octagon above the pendentives, while higher up it is made into a circle by rows of serrated brick projecting corbelling. The Niches of the Masjid were elegant and the arches were cusped, but very little of them are now visible, owing to rubbish and jangal.

The Dargah is a commonplace building partitioned off from the main Court by a plain wall with a small doorway, which I suspect is a later addition. Traces of other partition walls exist dividing off the Court into two smaller parts besides the main central part fronting the Masjid itself, and they too are probably later, these spaces were probably partitioned off for dwelling purposes. The Masjid contains a tomb of Shah Majlis. His biograply is known to the Muhammadans of and near Kalna. There is a Dighi within a ½ a mile of the masjid nearly as big as the one at Bargaon, called Majlis Saheb's Dighi. Annually a Mela is held there on the Uttaráyan Sankranti day.

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On the whole. I think the removal of the rubbish desirable, and it is absolutely necessary if details of construction are wanted.

Somewhat further on, on a turn of the same road is a small inclosure with a small entrance numbered 59 in the new addition to the Bengal list, now completely blocked up by a great tree, so that the only access is by climbing the wall. Within, is a solitary tomb, said to be that of Majlis Saheb's brother, with a very well-preserved inscription in black stone. The inscription is numbered 209 in the current year's list. Close to the Tomb is a large masjid, which is either nameless or known as Majlis Saheb's masjid: (indeed every masjid here is called Majlis Saheb's masjid) which stands in what was once an extensive cloistered Courtyard, but which now stands on an open level spot, all but the lowest courses of the cloisters and inclosing walls except the entrance gate having long ago disappeared. Of the entrance gateway which was in the centre of the east wall, there remains now the stone side posts and portion of the jamb, with the hole for sliding in the beam with which the gates appear to have been closed when needful. Stone steps leading up to the gate still exist in front of the gate, but of the rest of the walls only the lowest parts with the string course of the plinth in places, exist; as however the brick foundations appear to cover a breadth of about 15 feet, I infer that cloisters abutting against the walls existed.

Within the Courtyard stood the Masjid, the inscription from which No. (210 Bengal list) now fallen lies exposed close to its central archway: it still stands in fairish order, and is capable of conservation. The Masjid has 5 openings in front, and of course 5 prayer niches at the back; and a row of pillars in the centre, along its length, and 4 corresponding pilasters against each of the long walls in the interior, divide off the interior into 10 squares, roofed by 10 domes, which are still intact: the pillars which are 4 in number are dissimilar, the 2 middle ones being stout ones, and different from the other two, which are much more slender; the pilasters are all plain, and the arches spring as usual from the pillars and pilasters forming squares which are turned into circles by corbelled pendentives, the corbellings being alternately plain and serrated. The entire building with the exception of the pillars and pilasters is of brick moderately ornamented, but the niches are profusely ornamented: the central niche which is the largest has a 6 cusped arch profusely ornamented both on the faces, on the spandrils, pilasters, and along the entire interior of the recessed octagonal surface, by cut brick ornaments: the two next niches one on each side are somewhat smaller, and the south one alone is ornamented, the north one which is behind the pulpit being plain, the last pair of niches one on each side are plain and small but are double, that is there are 2 niches one over the other.

The pulpit is small and 2 storied but neither the lower nor the upper could ever have been meant for the preacher to stand in and preach, as the open archways giving access to the interior square space within the pulpit are too small for a man to walk through upright, and consequently any one going in and standing upright within, would have his face bidden behind the arch face. Of course the preacher may have stood on the steps outside and leading up the pulpit to preach, but as the ornamental line and cornices of the pulpit run *through* the steps of the staircase the stairs are obviously an after addition. I conclude consequently that the structure was not intended to he used as a pulpit, but as in modern imambaras, as the support of the Tabut of Ali on the muhurram festival. It is however profusely ornamented, although the arches of the upper storey are plain gothic; the corner pilasters upper and lower are niched recessed ornamented similar to those in the Temple at Deogarh but of brick, the lower arehes are also plain, but the cornice separating the upper from the lower storey is extremely rich, the pulpit was covered by a Dome which has partially fallen in.

The side openings on the North and South faces of the masjid were closed by lattice work in brick and covered by tunnel vaults, that is, the arches which appeared externally through the thickness of wall, appear also internally, but the front or east openings are covered with cross vaulting, the ridge of which runs at right angles to the ridge of the arches that appear on the exterior and interior faces of the wall.

The floor is at present lower than the ground level of the Court, and there are unmistakeable signs that water stands within the masjid to the depth of a foot or more in the rains, over the mud accumulation; but this is certainly due to the rising of the outer court from fallen debris and not to originally faulty design.

Detail plan and sections of the masjid are desirable inasmuch as the domes are yet intact, but this can scarcely he done without removal of rubbish and the erection of scaffolding. Rupees 50 would probably he sufficient for the purpose.

On the road to Majlis Dighi, in the court of a village hut in Muhalla Telpatti is a fine inscription No. 211 of the Bengal list; no one would tell where it came from, but it has certainly been brought from the masjid near, known also as Majlis Sahebs Masjid. This masjid was the finest masjid in Kalna, measuring nearly 50 feet in length by nearly 40 in breadth. It is of brick picked and strengthened with stone. A course of stone (a dark colored

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granite) runs right round the masjid through the entire thickness of the walls at the springing of the arches; this was obviously used to distribute the pressures of the arches more evenly and prevent unequal settlement, and it has I believe materially helped in arresting the destruction of the brickwork by crumbling away piece meal; the stone is apparently taken from some older building, as some of the slabs are smoothly worked, while others bear chisel marks: It appears that these not exactly fitting their positions, were cut to suit, and as the masjid was covered with plaster, and as the architects of the Muhammadans seldom took the trouble to smooth the surfaces of the stones they cut they were left somewhat rough.

The front facade as well as the end of the masjid are broken up and the dead flat of a straight surface relieved by square headed projections at each opening, each opening being as it were cut through a rectangular frame, projecting in advance of the general lines of the walls, and these projections are ornamented with sculpture in cut brick: in addition to these; four octagonal towers adorn the corners; these are divided off into three stages by cornices, the lowest running just above the springing of the arches, the next at the level of the top of the projecting doorway frames: the towers are profusely ornamented with sculpture in cut brick; they appear to have been surmounted a little above the level of the top curved cornice of the building by small domes in the manner of the Gaur ones, but of course only slight traces of these domes now exist. The facade in front contains three openings and the ends two openings, these however being closed by lattices of cut and ornamental brick. The openings in front which were apparently open are roofed over by cross vaulting, that is to say, the ridge of the vaulting over the deep jamb or portion of the opening within the thickness of the wall, running at right angles to the ridge of the arches which are seen in front exteriorly and the counterparts of which cover the opening interiorly, but the side latticed windows are covered by tunnel vaults or a prolongation of the arching which is seen exteriorly and runs through the entire thickness of the wall to the interior surface. The walls are five feet thick, and the corners of the jambs of both the front entrances and the side latticed windows are ornamented and strengthened with stone pilasters flush with the jamb surface.

The interior which measures 36 × 24 is divided down the centre by a row of 2 pillars in the middle and 2 pilasters at the ends, pilasters also occupy the corners and the centres of the spaces between the 3 openings in front and the 3 niches in the back wall, there are thus two whole pillars, 6 half or pilasters, and 4 quarter or half pilasters, which supported gothic shaped arches, judging from the fragments that remain: and these arches supported

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6 domes, all are now fallen. The domes sprang from solid pendentives which gradually projected out by corbelling from the corners, in alternate flush and serrated courses.

The interior was profusely decorated: the faces of the arches were ornamented with a fine geometrical pattern cut in relief, the pillars were 16 sided ones, (at least such portion as is now visible above the debris is 16 sided) elegantly exquisitely ornamented with chains and bells sculptured in bold relief, and therefore presumately taken from some demolished Hindu temple, but the glory of the Masjid were its prayer niches; these are inferior only to the Adina ones in superb profusion and taste of ornamentation: the side ones are 7 cusped and profusely decorated with cut brick patterns, the sides of the niches being of stone. The central one is of stone; its facade being a trefoil of exquisite grace and the surface of the projecting arch covered with rows of diamonds, strings of pearls (in stone) festoons of leaves, and a trefoil leaf edging: the spandrils are ornamented with 2 lotuses each, springing from a divided stalk, which itself rises from the side pillars, also of stone, which support the ends of the trefoil arch: the interior of the semicircle of the prayer niche is cusped and carved into tall trefoil headed panellings.

But the accumated rubbish on the floor hides from view the greater portion of the niches; and of course renders all measurement for drawings to scale impossible, it is extremely desirable that this rubbish be removed, and probably Rs. 50 will be enough.

The Armenian Church in Chinsurah is of interest as being one of the oldest Christian Churches in India. The inscription over the doorway Bengal list No. 213 gives its date of erection as 1695, it was built apparently by Katchik son of Peter, whose name appears on a brass tablet at the foot of the raised platform on which stands the altar: the date of his death is doubtless given in the tablet, but during the two hundred years, repairs and a layer of marble have so raised the floor as to bury part of the tablet and it is not possible without injury to it to get at the rest of the inscription. (Inscrption. No. 215 Bengal list.)

This man Peter's name occurs in the History of Julpha in Persia as one of the chief merchants, there is however no record of his having ever come to India. It is recorded however that the accession of Shah Suleiman to the Persian throne (known as Shah Sufi) in 1665 who gradually increased the burdens of taxation and of other irregular demands (among them of 2 girls annually) drove many of the inhabitants to seek their fortunes in foreign countries, and a powerful impetus was given to the exodus by the conclusion of a treaty between the Armenian Merchants of

Julpha or Ispahan and the English E. I. Company, dated June 22nd, 1688, by which free permission was given them to dwell within the Company's possessions, to travel by their vessels, share equally with British Merchants in any profitable investments, and to be eligible for employment in positions of responsibility and trust the same as British born subjects; it must have been some of these merchants who traded in India.

The tomb stone now placed in the centre of the floor under the steeple was originally at the foot of the altar, but in the course of some repairs about 12 years ago, it was found necessary to remove it and it was placed here originally as a temporary measure, but here it has since stayed: it records see Inscription No. 214 Bengal list, the death in the Armenian era 1145 corresponding to A. D. 1697 of one Marcus (Mark) a respectable merchant of Julpha who had travelled much and who was the son of Garib Khoja of Shosh city, also a merchant of good fame, praiseworthy and respectable.

The inscription was written by the then Priest of the Armenian Church, Gregory who was no doubt the first priest who officiated in the newly built Church at Chinsurah.

Of the numerous other tomb stones, in the Churchyard which is also the graveyard, none are of any importance or interest except to their descendants.

The Architecture of the Church clearly indicates European design, probably it was designed by the Portuguese who had sometime ago settled in Satgaon, close to which in Bandel they had built a Church in 1599 A. D. the Architecture calls for no remark being of the usual common-place style prevalent in Calcutta. The steeple of the belfry is however later, having been built, as attested by an inscription Bengal list 216 in A. D. 1829 by Sophia, wife of Semeon Phanus Bagram in memory of her husband.

The adjacent Roman Catholic Church of Chinsurah is seen from the inscription to have been built in A. D. 1740.

BHAGULPUR DIVISION.

The places visited in this Division are 1 to 19, 21, 22, 79, 80, 100, 101, 109, of the list as published and additional Nos. 113, 114, 115.

The district of Bhagalpur forms part of what was known as Anga, of which the first king was Anga (after whom the district was named) the reputed son of Bali the 12th in descent from Anu who was the 4th son of Yayati. From Anga the first king, whose capital however is not known as Champa but as Malini, Champa Raja the founder of Champa (the Champa Malini of the Bhagavata puran, also known as Champapuri and Champanagari) was the 8th in descent, and consequently the 21st from Yayati.

In all attempts to fix early Indian dates there is but one fixed point, the reign of Chandra Gupta. This Duncker places at 315 B. C. Cunningham places the accession of Asoka at B. C. 264, and consequently as Bindusara and Chandra Gupta reigned altogether 52 years (48 years by another account the Matsya Purana.) We get to 316 B. C. as the accession of Chandra Gupta. I accept 315 B. C. as an easily remembered date.

From Chandragupta upwards, the evidence is very conflicting. It has become fashionable to bepraise every thing Buddhistic and suspect every thing Hindu but as there is not the shadow of a doubt that the Buddhistic Chronology before Asoka has been intentionally and deliberately tampered with (Turnour, Cunningham, and even the latest writer Duncker, all admit this.) I fail to see why, in face of this known falsification of the Buddhistic Chronology, we should persist in following it, the more so as I hope to shew that Hindu Chronology gives results quite consistent. I therefore reject Duncker's finding of the date of 1283 B. C. for the accession of Brihadratha, the first of the Barhadratha Dynasty of Magadha.

By the Puranas, the Nandas who preceded Chandra Gupta reigned altogether 100 years. The Buddhist records say Susanago, on the deposal of Nagadasoko, reigned 18 years, followed by Kalasoko 20 years followed by his 10 sons, whose reigns amounted altogether to 22 years; these again followed by 9 who reigned also 22 years. Making a total of 82 years from the deposal of Nagadasoko. Nagadasoko reigned 24 years, preceded by his parricidal father and grandfather, who reigned altogether 8 years, and were preceded by Ajatasatru's son who reigned 16 years; making a total of 130 years from Chandra Gupta to Ajatasatru's death.

The improbality of this is evident: Ajatasatru's son murders his father, and is murdered by his son; and this process continues down to Nagadasoko's accession; that is to say the 5th generation from Ajatasatru ascends the throne within 24 years of the death of Ajata Satru and each of the 4 is old enough to murder his father! could absurdity go further?

The Vishnu Purana says, that, from the beginning of the Kaliyuga to the accession of the first Nanda, a period of 1015 years had elapsed: the traditional beginning of the Kaliyuga was the accession of Parikshit; or to be more definite, the era referred to as the Kaliyuga by the Vishnu Purana which defines its Kaliyuga as the accession of Parikshit by saying "at the birth of Parikshit, they were in Magha, and the Kali age then commenced."

Whatever discussion there may be therefore as regards the identity of the astronomical Kaliyuga and the Kaliyuga as distinctly defined by the Vishnu Purana, there can be none, that from Parikshit to the first Nanda according to the Vishnu Purana was 1015 years and consequently to Chandra Gupta 1115 years, (*i. e.*), the birth of Parikshit took place in 1115 + 316 = 1431 B. C. Duncker gives 1418, but I cannot follow his reasoning; his later dates of 1328 and 1175 B. C. for the accession of Brihadratha Jarasandha's father are obviously inconsistent with either his date of 1418 B. C. or my 1431 B. C. as the date of Parikshit's birth.

As Jarasandha of Magadha was killed by Bhimasena a few years before the great war and the birth of Parikshit, his death may on this calculation be in round numbers, placed at 1450 B. C.

But from Jarasandha to Chandra Gupta the Puranic lists give in almost unbroken hereditary succession 46 Kings. Consequently 46 Kings reigned 1450 – 316 = 1134 years; giving the very reasonable period of 24·6 years to a reign, where the reigns are almost all in hereditary succession.

But Karna of Anga was a contemporary of Yudhistira, and was made King of Anga by Duryodhana, at the trial of arms just before the first exile of the Pandavas, during which Jarasandha is killed. Consequently Karnas accession cannot be placed more than a very few units of years prior to 1450 B. C. As absolute accuracy is unattainable, Karnas accession may safely be placed at 1450 B. C. in round numbers.

From Karna to Anga is 20 generations. Karna being the 21st from Anga: applying now the just found period of 24·6 years per generation, Anga's accession will fall to 1450 + 492 = 1942 B. C. that is the foundation of the Kingdom of Anga dates approximately to 1942 B. C.

From Anga to Yayati is 13 generations, (*i. e.*), Anga is 13th in descent after, and the 14th in reign from, Yayati. Therefore Yayati's accession must be placed 1942 + 320 = 2262 B. C. in round numbers the accession of Yayati may be placed with reasonable probability at 2250 B. C.

Dasaratha gave his daughter Santa to Romapada to be adopted, as he had then no son; she was married to Rishya Sringa, Romapada subsequently got a son Chaturanga.

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Romapada was the 6th King from Anga, his accession would be therefore 5 times 24·6 years subsequent to Angas that is 192 — 1243 = 1819 B. C. and his son's would be about 1785 B. C. Rama Chandra was the contemporary of both. Rama's accession must consequently be placed somewhere about 1800 B. C. But this by the way.

Champa the founder of Champa-Nagar or Champa-Malini or simply Champa, was the great grandson of Romapada, the father-in-law of Rishya Sringa: as Romapada's accession took place about 1819 B. C. Champa's accession must be dated to 1819—49 = 1770 B. C. in round numbers.

I do not think we have data to approach the real date with greater accuracy. I consequently place the foundation of Bhagalpur town at 1750 B. C. in round numbers.

Of course it will be understood that I refer to ancient not the modern Bhagalpur.

I would in passing remark that taking the Solar list as given in the Hindu Puranas from Rama, and working upwards to Manu Vaivaswat who had no human father, the period of Manu Vaivaswat comes to about 4500 B. C. a period which agrees with the generally accepted Biblical record of the age of Adam to within an eighth.

Remembering the method of calculation adopted, the coincidence is certainly to say the least remarkable.

I am fully aware that as it has grown to be a fashion to exalt Buddhism and the various other isms of recent origin, it has become equally the fashion to ridicule the Biblical record; such a procedure is unscientific in as much as before rejecting a venerated tradition, which has the evidence of ages of tradition in its favor, and is corroborated in many points, not only by independent, though also traditional evidence, but in some cases by recent Archæological research, and monumental evidence, it is at least necessary, that something more than the mere ipse dixit of men, who, however eminent in their own scientific spheres of research, are wholly unappreciative of the History of Man not as an animal, but as *MAN, with the living soul breathed into him* by an Almighty Creator; should be brought forward.

This kingdom of Anga appears to have been bounded on the West by the Magadha Kingdom; on the North by the Ganges, and also in all human probably on the East; on the South, I should feel inclined to fix its boundaries at the Damuda River, following here Cunningham's boundary of the kingdom of Champa in Hiouen Thsang's time. On the west, it is evident from the Ramayana, that Rishyasringas hermitage was within the Anga

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kingdom. As this hermitage is traditionally situated in the Kharakpur. or Singhol Hills and known to this day as Sringi Rikhi (see Vol. VIII. p. 127 Arch. reports) the boundary betwen Anga and Magadha must have been the Kiyul (ancient Rishikulya river, with its sources in the Saktimati range see Arch. rep. VIII. 124, 125).

The capital of this kingdom appears originally to have been a city called Malini, which must have been very close to Champa; as Champa when founded by Champa raja was known (as we find from the Bhagavat puran) as Champa Malini.

As Champa raja's accession took place about B. C. 1760—and as the accession of Brihadrathas father Vasu, must be placed 74 years before Jarasandhas death in 1450 B. C. (*i. e.*) in 1525 B. C. it would appear that Champa founded in 1750 B. C. must be an even older city than Girivraja, which the Ramayana says was founded and so named by Vasu,

"And Vasu bade his city fair
The name of Girivraja bear."

The difficulty here is that as Rama lived about 1800 B. C. Viswamitra could not possibly have related to him anything of Vasus doings.

It will be seen from Arch. rep. Vol. XIII p. 57 that the limits of the Ayodhya Raj in Dasarathas time extended right down to the South end of modern Sirguja.

Vasu the father of Brihadratha of Magadha, conquered by order of Indra the country of Chedi, and is known as King of Chedi: his real name was Uparichara, called also Vasu he had 5 sons whom he installed governors; (and they after his death "planted kingdoms" and "towns in their own names and founded separate dynasties that lasted for long ages." Of these, one was Brihadratha, King of Magadha; doubtless therefore another son must have been King of Chedi and so on. Vasu's empire must consequently have extended from the Western boundary of Anga to the Western confines of Chedi or Tripura (which has been identified with Tewar near Jabalpur), and from the Ganges to Rayapura in the Central provinces, and must have included Sirguja as well as Magadha and the modern Shahabad, with Riwa and the upper half of the Central provinces: and it would have been absurd for Viswamitra to inform Rama on the banks of the old Son that

"This fertile spot on which we stand
Was once the high souled Vasu's land"

for Rama must, ever since crossing the Ganges, have been travelling on that same "high souled Vasu's land." Further as Vasu's domains were parcelled out between his 5 sons who founded dynasties which lasted for "long ages," it would have been impossible for the territory of Dasaratha to have extended down to Sirguja, which would have been part of the Kingdom of one or other of Vasu's descendants.

Lastly the real name of Vasu was Uparichara.

It is therefore clear that the Vasu mentioned in the Ramayana as the founder of Girivraja, was quite a different king from Vasu Uparichara the father of Brihadratha.

Nor is there much difficulty in finding the real Vasu, the founder of Girivraja. Although Griffiths translation says nothing about it; Vasu the son of Kusa of the Lunar race (Kusa being the great great grandson of Jahnu, and the 9th in descent from Pururavas, the grandfather of Yayati by his 3rd son Amavasu, Yayati being his grandson from his first son Ayus) is in the Ramayana itself, distinctly mentioned as having founded Girivraja; not Uparichara Vasu the son of Kritaka of another branch of the Lunar race.

As Yayati's accession has been assigned to the rear 2250 B. C.; his grandfather Pururavas must be placed at 2300 B. C. and therefore Jahnu the 5th in descent from him must be placed at 2177 B. C. and Vasu the 10th from him at 2004 B. C. that is the foundation of Girivraja may he ascribed in round numbers to B. C. 2000. Champa consequently it appears was founded, nearly 2½ centuries after the building of Girivraja.

The accession of Jahnu has been placed above at 2177 or in round numbers 2200 B. C. and the performance of his austerities, during which the river Ganges overflowed his place of worship, may well be placed 25 years earlier, *i. e.*, at 2225 B. C. It was then that he met Bhagiratha the ancestor of Rama Chandra.

To test the accuracy of the dates assigned above to the various personages, I shall compare the date of Bhagiratha, derived independently, with that of Jahnu.

Bhagiratha was the 20th ancestor of Rama Chandra, and the son of Dilipa., but he was born the Ramayana says after Dilipa's accession to the throne, and did not meet Jahnu till he had already, not only commenced to reign, but had abandoned his kingdom and had succeeded in bringing the Ganges down.

Dilipa's accession would be according to the calculation from Rama, 1800 + 516 or 2316 B. C.; and Bhagiratha was born after his father had been some time reigning, and was old enough to succeed to the Empire on Dilipa's death: his accession therefore cannot be placed earlier than about 2280 in round numbers. As he only met Jahnu after he had reigned and abandoned his kingdom in pursuit of Ganga, the meeting must have taken place say about 2250. Which agrees fairly well (remembering that the calculations are based on averages only). with the 2,225 B. C. which has been arrived at from the calculations for Jahnu on the basis of the puranic genealogy of the Lunar dynasties.

Before taking leave of this portion of the report which deals with dates, it may be of interest to point out, that the average of 24·6 years per reign in *continuous hereditary succession* of several regins is not uncommon. Taking the reigns of the Mughal Emperors, so long as it continued a direct hereditary succession, that is from the accession of Babar to the accession of Jehandar Shah; the period is 186 years; during which 7 generations ruled, giving an average of 26·6; which is even more than that deduced from the Puranas: including the reign of Jahandar there are 8 generations who riegned of 186 years; or an average of 23·4 years per generation; so that, for India, the average of 24·6 years per generation, is not too much. In Europe I believe 30 years per generation is regarded as a fair average, but there is an impression of the average 24·6 being high for *India*, to which Duncker gives expression, when, after calculating on an average of 25 years, he goes on to calculate on an average of 15 years per reign, with the remark, that it is "an average usually correct in long lists of reigns in the East;" forgetting, that the *reigns in question are also generations.* Where the reigns are not also generations I freely admit that 25 years is a great deal too high an average, but the Puranic lists of reigns are at the same time, with *rare* exceptions, lists of regular genealogical succession; and the average of 25 is not too high; indeed it has already been shewn, that it is not high, even so late, and for such troubled times, as the last 300 years; and the consistency of the results above deduced, on different and independent lines, from the use of the average of 24·6 gives a fair presumption of the applicability of the average, and of the credibility of Puranic genealogy.

Bhagalpur anciently Champa, Champa-Malini, Champavati Champapuri Romapadapuri (from Lomapada or Romapada,) Karnapura; is mentioned in Buddhist records. Turnour extracting from the "Buddhawansadesana" one of the sub-divisions of the Suttapitaka of the Pita Kattaya, says of the 8th Buddha, Padumo.

"Padumo born at Champayanagara, parents Asamo Maharaja and Asamadevi; his Bo tree the Sonaka. Gotamo was then a lion, King of Animals."

In Rhys david's translation of Buddhist Jatakas, Champa is also mentioned as the birthplace of Paduma. "Now the city of Paduma the blessed one, was called Champaka, his father was Paduma the king, his mother Asama; Sala and Upasala were his chief disciples, Varuna his serviter Rāmā and Uparāmā his chief female disciples, the crimson tree his Botree."

In the list of kings, Beals Romantic History of Buddha p. 18 "Two thousand five hundred descendants of the last successor of the Dynasty 'able to destroy' lived at Champa."

It is also mentioned as Champa in Jaina records. The Kalpa Sutra records, that their last heirarch Mahavira, passed 3 rainy seasons in "Champa and Prishtha Champa" the record is very valuable, as shewing, that the city of Champa occupied both banks of the Chandan River; for I can only interpret Prishtha Champa the city to the Prishtha, or back of, Champa, as a suburb close to and yet in someway separated from, Champa; a condition fulfilled by its being separated from it by the Chandan River. And in this supposition I am confirmed by the actual existence of one large mound and several minor mounds across the little Chandan River: the small mounds are certainly of brick, as fragments lie scattered; the large mound needs exploration: remembering that Champa is one of the oldest cities in Bengal, the importance of careful, extensive, and as far as possible through, exploration by trial trenches; the only method short of a very expensive thorough excavation, by which the exploration can be made with any hope of arriving at results of interest; appears to me so desirable, that I urge it for the favorable consideration of the Director-General and of Government.

As the Kalpa Sutra was written about B. C. 300. (Professor Jacobi) it is clear that at that date certainly, and probably during the period of Mahaviras existence in the 6th century B. C. this suburb of Prishtha Champa actually existed; and indeed it must as a village have continued to exist down to our own times. The profusion of names "Champa, Champavati, Champapuri, Champanagari, Champa Malini" besides the names Lomapadapuri, Karnapuri and Karangarh, points to the existence close to each other, of more than one city which could exclusively claim a monopoly of all the variants, and the actual existence of two villages, on opposite sides of the Chandan, called Champapur and Champanagar, which exist to this day, together with the actual existence of mounds of ruins across or to the west of the river, as well as of undoubted ancient remains on the East side of the river, appear to me to completely establish the fact of the existence of a great city, divided through by the Chandan River, of which the eartern portion now known as Champa-

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nagar would correspond to ancient Champa, Champanagari, Champa-Malini, while the western portion near which is the village of Champapur, would appear to mark the site of Prishtha-Champa and Champapur.

Legend and tradition also mention the existence of a Champapur in connection with the romantic story of Champeli Rani of Champapur, who was so unfortunate, that every man she married, died on the wedding night, being dragged a corpse out of the bridal chamber; till at last as no one would marry her voluntarily, it was made a sort of a tax on the people, one husband being provided for her by lot daily, in hopes that at last, some one would come out alive, but without success; till a prince from a distance who had heard of her dazzling beauty and her misfortunes, determined to risk his life voluntarily. By a fortunate accident, he heard a warning in these words "Champapur Champeli Rani, jage to pawe, sowe so khowe" (*ie*) Champapur Champeli Rani, who keeps awake wins, who sleeps loses her.

It need hardly be added that the appearance of a voluntary suitor of high rank and handsome appearance was a joyful event in Champapur. The ceremony performed, and the pair carried to the bridal chamber, the words of warning occured to the prince, who with drawn sword sat down to watch through the night: to his horror he saw a venomous snake issue out of the beautiful princess' mouth and advance to attack him, which he with his sword cut into pieces after a desperate struggle, and at last fell into a deep sleep exhausted, but safe: in the morning the accustomed Dom arrived at the chamber door to drag the corpse out, but on breaking open the door, the prince was, to the joy of his father-in-law, and of the country, found alive; and the heap of cut up fragments of the serpent explained the mystery; needless to add the wakeful prince lived happily ever after.

The era of most of the indigenous stories appears to have been about the 9th century, at which time therefore Prishtha Champa or Champapur must have been still in a flourishing state. And probably contained the Royal residence.

The Dasa Kumara Charitra mentions Champa, though in far from a complimentary manner, as a city full of rogues, a character also given it by the common saying "Bhagalpur ka bhageliya aor Kahalgaon ke thag."

From the Dasa Kumara Charitra we learn that Sinhavarmma was once a King of Champa and that Champa was beseiged and taken by Chandavarmma; it had evidently then a fortress capable of standing a siege; the Dasa Kumara Charitra is supposed to have been written about the 11th Century.

The Dulva (Journ. As. Soc. I.) mentions Champa as one of the 6 Chief cities of India.—

Colebrooke in Transactions of the Royal As. Soc. says that Vasupujya one of the Jain heirarchs died at Champanagar in the reign of Dadhivahana Raja who lived at Karna.

Turnour extracting from the Dipavanso (Journal Asiat. Soc. VII.) in detailing the succession of Kings of the present kalpa says that Mahindo and his 12 descendants reigned in Champakanagara, a variant of Champanagar.

It is therefore clear that the capital of Anga continued to be Champa, from the earliest dawn of tradition down to the 11th Century; which so far as I can remember, is the last mention of Champa as a great city, and the capital of a Kingdom, for there is strangely enough, no mention of Champa; in the invasion of Bengal; by the Muhammadan historians.

Champa is also described by the Chinese travellers. Fa Hsien's account is interesting; he says. "Following down the river Ganges in an easterly direction for 18 yojanas distance, we find the great Kingdom of Tchenpo (Champa) on its Southern shore. In the place where Buddha once dwelt, and where he moved to and fro for exercise, also where the four previous Buddhas sat down; in all these places towers have been erected and there are still priests resident in them. (Beals translation p. 191-129. Gile's translation as regards Champa is substantially the same)

Hiouen Thsang gives a longer account, and one of greater interest as he gives the legend of the foundation of Champa, which it need hardly be added is utterly different from the Hindu account; it is of interest however as proving, that among the Buddhists the antiquity of Champa was supposed to be even greater than that of Rajagriha, for he says of it "this was the capital of the country of one of them, and the first of all the cities or Jambudwipa; I extract the entire passage as it is of great interest.

"This country (Champa) is about 4000 li in circuit. The capital is backed to the North by the River Ganges, it is about 40 li round. The soil is level and fertile (fat or loamy), it is regularly cultivated and productive; the temperature is mild and warm (moderately hot); the manners of the people simple and honest. There are several tens of Sangharamas, mostly in ruins, with about 200 priests. They follow the teaching of the Little Vehicle. There are some twenty Deva Temples which Sectaries of every kind frequent. The walls of the capital are built of brick and are several tens of feet high. The foundations of the walls are raised on a lofty embankment, so that by their high escarpment they can defy (stop) the attack of enemies. In old

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times at the beginning of the Kalpa, when things (men and things) first began, they (ie) people inhabited dens and caves of the desert. There was no knowledge of dwelling houses. After this a devi (divine woman) descending in consequence of her previous conduct was located amongst them. As she sported in the streams of the Ganges, she was affected by a spiritual power and conceiving, she brought forth four sons, who divided between them the government of Jambudvipa. Each took possession of a district, founded a capital built, a town and marked the limits of the frontiers. This was the capital of the country of one of them and the first of all the cities of Jambudvipa."

In the interval however between Fahian and Hiouen Thsang, Buddhism in Champa appears to have declined, for while Fahian mentions the existence of several distinct temples, to which in his time important traditions attached; as the Temple on the spot where Buddha once dwelt; that, where he took excercise; and that, where 4 previous Buddhas sat down: Hiouen Thsang only says that "there are several tens of Sangharamas mostly in ruins." As Hiouen Thsang is particularly careful to give us every detail of the various holy shrines he visited, with their legends if any; the absence of all mention of the names or legendary holiness of the Champa ones, with the statement of their being "mostly ruins"; shew that the traditions attaching to the buildings noted by the earlier traveller had perished, and the buildings themselves gone to ruin, when the later traveller visited them. There is however mention by Hiouen Thsang of the fort, and his description is correct so far as I can judge without excavations. It evidently applies to the fort of Karnagarh, the earthen ramparts of which where now almost level with the general surface of the ground within the fort, still tower 50 feet above the surrounding fields outside, and which consequently, when intact, must have been "several tens of feet" high.

That the fort stands on a mound, there cannot be a doubt, though how high the mound was, it is not posible to ascertain without excavation. Hiouen Thsang says it was artificial; if so the mound; remembering that Hiouen Thsang's visit was made in the 7th century, must have been, not a specially built mound, but the ruins of Karnas famous city Karnapura, judging from the name still attaching to the spot; examination of the fort so far as it can be done without trial trenches, shews the walls to have been built of Bricks 18 inches long 12 broad and 3 inches thick, thus placing the building of the fort (in the absence of all other evidence except that of the size of the bricks,) in the quarter millennium about the beginning of the Christian era. But as there is not the shadow of a doubt regarding the continuous existence of Champa from the 18th century B. C. downwards as the Capital of Anga, and as from the name of the fort, the probability is strong that it occupies the ruined mound of the older site of Raja Karnas fort of the 15th century B. C. the earlier remains, if any exist, have to be looked for by deep trial trenches.

As one of the cities in Bengal known with absolute certainty to date to the pre-Asoka period, and furthur in view of the almost absolute certainty that in the mound on which the present ruined fort of Karangarh stands, we have the ruins of Karnas city, and that it is not easy in any other site that I can think of, in Bengal, to fix with such absolute precision, the actual spot where the ruins of a pre-Asoka capital city stand, for the ruins of Gaur and of Girivraja are a great deal too extensive for such precision, the precise site of the capital of Kalinga is yet a matter of doubt, Mithila has not been seen by me, and is besides within the Nepal frontier, and therefore inaccessible, and the greater part of Pataliputra (indeed the entire city except perhaps the southern strip) has long ago " fallen in" into the river as the Chinese records tell us (and the little there is is not available for exploratory trenches) I consider Bhagalpur and particularly Karangarh, to be the spot, where, if any where, if any where in Bengal, successful exploration may bring to light, the remains of one of Indias *OLDEST CAPITAL CITIES.*

It would be strange indeed, if a capital city so well known, and which enjoyed such a continuous existence, should not be mentioned by the Western Geographers. Yule, with correct intuition, has identified it with Kartinaga, although it is clear from the note of interrogation following his words, " Kartinaga Karnagarh near Bhagalpur an ancient site ?" that, although a happy inspiration led him to the identification, he had no very tangible grounds to go upon. Those tangible reasons, have now I hope, been furnished in profusion.

It is of interest to note, how traditions linger on in modified forms, and are passed on from religion to religion. One of the synonyms of Champa, the Capital of Anga, is Lomapadapuri, so named from Romapada or Lomapada, the father-in-law of Rishyasringa the seduced hermit ; Lomapada was so called, because he had hair growing on the soles of his feet. He lived about the end of the 19th century B. C. The legend however of the hairy foot reappears in Buddhist tradition, where Sona, the rich merchants son, is said to have had hair growing on the soles of his feet ; (see Spence Hardy) " red hairs turning towards the right ;" the legend is repeated in a somewhat altered form by Hiouen Thsang (Beals transl Vol. II p. 188.)

That the original tradition belongs to the Hindu legend, is, apart from all question as to the comparative antiquity of the

Ramayana and of the Buddhist legends, settled by the circumstance that the legend of the hairy soles of the feet may have been intended to account for the name Lomapada which occurs in the Hindu legend; as we know in several other instances, ingenious stories having been invented, to account for other names; notably the name of Vikramitya Gardhabhila; but that it does not explain, and cannot account for anything in the Buddhist legend. But if the original tradition, thus accounting for a Hindu legend, is therefore clearly attributable to it in the first instance, its occurrence in the Buddhist legend, where it is as it were "in the air," and where there is, not only no reason for bringing in the legend of any hairy footed being, but especially none, for attributing it to an inhabitant of the very Champa, where Hindu traditions place *their* hairy footed king; stamps the Buddhist tradition unmistakeably, as an adaptation of an older, and pre-existing tradition, too well known, and too firmly beleived, to be ignored or totally discredited, yet too closely connected with a cardinal belief of the Hindu religion, to be safely adopted by the new cult, without such modification, as should render it totally harmless for the encouragement of even a partial faith in the older cult. Of the political histry of Champa prior to the Christian era little is known.

The Kingdom of Anga was founded by Anga, son of Bali Raja, who was evidently a very powerful king, as his 5 sons became kings of the 5 kingdoms in Eastern Bengal. Bali appears in fact to have been one of the great kings of East India, and his kingdom extended from the Kiyul, and the Kosi rivers, eastwards to the western limits of Tripura; (Tipara) and from the foot of the Himalayas, to Ganjam on the south.

The limits of Anga's kingdom, which became a separate kingdom, about 1950 B. C. have been already defined. It must have ceased to be an independent kingdom, for some time prior to Karnas reign; judging from the description of his adoptive father Adhiratha, advancing as an humble, and poor charioteer, with tears of gladness streaming dawn his eyes, at the great success of his son Karna, in Duryodhana's games, held before the first exile of the Pandus, I cannot suppose that he was an independent reigning king; rather it would appear, that Vasu, the great king, whose grandson Jarasandha, the monarch of only a fifth of his fathers empire, became so formidable; had conquered Anga, and added it to his already extensive empire. In this I am confirmed by the circumstance, that Vijaya, the great grandfather of Satya Karman, Adhirathas father, being born of a Sudra mother, would not, naturally, hold a very strong position in the esteem of his subjects; and either he, or his son, who were about contemporaries with the great Vasu, would offer very strong temp-

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tation to a great powerful and certainly ambitious king, to annex his kingdom. I hold therefore that Anga ceased to be an independent kingdom, about the close of Vijaya's, or during his son Dhritis reign ; that is say, about a hundred years before Karnas installation by Duryodhana, as king of Anga, about B. C. 1450.

That in Karnas time, Anga was not independent, and Karnas adoptive father, was not a reigning monarch, are only too well established by the Mahabharat.

During this period of a hundred years, from the extinction of Anga as an independent kingdom, to Karnas installation ; the capital Champa, would naturally fall into decay ; and this would sufficiently explain, how it was, that Karna, whose reign fell in troubled times, and who consequently, would not have been likely to build a new capital if he found one ready to hand ; was obliged to build a capital, which became known as Karnapura.

The revival of Anga as a separate kingdom, with Karnapura as capital, appears to have been of short duration ; as the Vishnu Purana, which gives lists of the kings of the neighboring kingdom of Magadha, for many hundred years after the great war, closes its list of the Anga kings, with Vrishasena the son of Karna : probably the country became absorbed in Magadha. I would place the extinction of Anga, as a separate kingdom, in round numbers, at 1400 B. C.

What happened from this period down to the time of Buddha, can only he matter of conjecture, all that can with certainly he inferred, is, that Karnapura must have continued to exist, alongside of Champa, as a place of some note, to the earlier centuries of the Christian era, for the name to have found its way into Ptolemy's list ; at the same time Champa also existed, as a city of some importance ; for the father of Sona (of the hairy-foot legend in Buddhas life) is said to have possessed " thousands of houses" " surmounted by towers" in the city of Champa.

That Anga was part of the kingdom of Magadha, is seen from the story of Sona, in Spence Hardy ; where, on Bimbisara, the Magadha king's inquiry, as to the place from which such exquisitely scented rice had been procured, as Buddha was eating just after his recovery from illness in Raja Griha ; he is informed that it was from his " own city Champa." The same conclusion is inevitable from Hiouen Thsang's modified version of Sona's legend.

That it continued to be a dependency of Magadha, down to the reign of Vindusara, appears probable from the circumstance,

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that Asoka's mother; Subhadrangi; a girl of extraordinary beauty, and of whom it had been foretold, that she was to be the wife of a king, and the mother of a universal monarch; was carried and presented to Vindusara by a brahman of Champapuri. She was no doubt treated at first as a slave girl, for the name of her son Asoka was so given because his birth emancipated her from her sufferings as a slave girl (Rajendra's Nepalese Buddhist Literature.) It is scarcely likely that the astute brahman would have carried her to a foreign king, if he had a king of Anga handy; and still less likely, that the king, if one existed at Champapuri, would have waited for the brahman to present her to him, or to deport her to a neighboring king, before carrying her off himself, with or without the brahman's consent.

Of the absolute certainty of Asoka's empire over Anga, as over the rest of India, no proof is necessary; how long after Asoka, Anga continued a dependency of Magadha, is however by no means easy to ascertain. If the episode of the seige, capture, and emancipation, of Champa and of its King, in the story of the Dasa Kumara Charitra, is founded or some real basis of truth, Anga must have regained its independence, at some period before the 11th century; though such independence must have been of a very temporary nature. The succession of the King of Anga and of its neighbouring Kingdoms, is so involved, that a brief statement of what is yet known of the successions of the paramount sovereigns, and of their successors in East and West Magadha will not be superfluous.

Starting then from Karna, in 1450 B. C. we have:

Kings of Anga ...	Accession of Karna ...	1450
	„ of Vrishasena...	1425 B. C.

In 1400 B. C. Anga became absorbed in the kingdom of Magadha, and so continued.

The accession of Brihadratha being placed at about 1500 B. C. We have 4 Kings of the Barhadratha dynasty reigning over Magadha alone, who with their dates of accession are:

Kings of Magadha only...	1.	Brihadratha ...	1500
	2.	Jarasandha ...	1475
	3.	Sahadeva ...	1450
	4.	Somapi ...	1425

The fifth, Srutavat, whose accession must be placed at 1400 B. C. was King of Magadha and of Anga also.

From Srutavat, downwards to Ripunjaya, the last of the Barhadrathas; are 20 reigns, equal to, in round numbers 490 years, at 24·6 years to a reign; bringing the extinction of the

Barhadrathas to about 910 B. C. (I refrain from giving a list of the 20 Kings, which may be found in the Vishnu Purana, and elsewhere). Or, working backwards from Chandragupta, the extinction of the Barhadrathas, and the accession of the Pradyotas, must be assigned to 915 B. C. more accurately.

From the Vishnu Purana, it is known that the 5 Pradyotas reigned 138 years: that is to 777 B. C. Therefore the accession of the Sisunagas must be placed at 777 B. C. The 10 Sisunagas reigned 362 years; consequently, the accession of the Nandas, took place B. C. 415. The 9 Nandas reigned 100 years, bringing the accession of:

10 Mauryas, Emperors of India reigning 137 years. ...	Chandragupta to ...	315 B. C.
	Bindusara ...	291 „
	Asoka	264 „
	Suyasas or Kusala ...	223
	Dasaratha ...	215
	(of the Barabar inscription or Bandhupalita.)	
	Saugata	205
	Salisuka	198
	Somasarman ...	190
	Satadhanwan ...	182
	Brihadratha ...	180

From the accession of Srutavat, to the death of Brihadratha the last of the Maurya dynasty, in 178 B. C., is 1222 years; during which Anga had ceased to exist, as a separate kingdom; although doubtless Governors on the part of the Paramount Kings, ruled the country; and probably from Karnapura as Capital. But as they were merely temporary sojourners in the capital, they would be little likely, to devote, either funds, or any special attention, to its embellishment, beyond keeping up the fort in a state of efficiency, and the old palaces they occupied habitable. During this long period of apparently peaceful rule, disturbed, so far as I can find, only by the rebellion during the reign of Padmachenpo (the Kshattraujas of the Vishnu Purana) when he was obliged to pay tribute, but by the advice of Bimbisara his son, he withholds, followed by a war, wherein Champa is annexed to the dominion of Magadha; analysis of the Dulva, Journal As Soc. Vol. I) trade would naturally flourish; and whatever the fate of the imperial palaces; private merchants, and money lenders, would go on growing rich; we accordingly find from Buddhist records, that Sona's father, possessed "thousands of houses" "surmounted by towers" in the city of Champa.

From the murder, in 178 B. C. of Brihadharatha of the Maurya dynasty, the Vishnu Purana fails as a guide to the political history of Magadha and Anga; for although the narrative

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of the Purana is apparently continuous, and goes on to specify the 12 Sungas, and the 4 Kanwayanas, in what is an uninterrupted succession; there is little doubt, that the dynasty of the Sungas reigned only in Western India, and part of what is now known as the Central Provinces, and the Southern portion of Malwa, where numerous records of their rule exist: (in fact in the Malavikagnimitra of Kalidasa, Pushpamitra is mentioned only as a general; and his son Agnimitra as King of Vidisa or Bhilsa) but assuredly, they did not reign in Madhyadesa; which; except a rare coin of Pushpamitra, occasionally; contains no record of their reign. Even in Western India, Rudradama's inscription proves, that their successors the Satakarnis, of the Andhra dynasty, were far from being Paramount Sovereigns of India. On these grounds I feel constrained to decline the guidance of the Vishnu Purana as regards the successors of the Mauryas ruling over Anga and Magadha.

But if the Vishnu Purana fails us here as guide, there are other sources of information, to furnish beyond the shadow of doubt, a sketch of the political vissicitudes of Magadha certainly, and probably of Anga.

Taranath (my information is obtained from Cunningham's coins of Alexanders successors, part I. Article Menander, pages 258, et seq; the originals being not accessible to me) records an invasion of India by foreigners, during the reign of and 5 years before the death of, Pushpamitra; he specially mentions, that they advanced as far as Magadha. As Pushyamitra is obviously the Pushpamitra of the Vishnu Purana, and he died according to the Matsya Puran in 142 B. C. the invasion must have taken place in 147 B. C.

The Astronomer Garga, in the Gargi Sanhita, after mentioning Salisuka, goes on to say "Then the viciously valiant Greeks, after reducing Saketa, Panchala country, and Mathura, will reach Kusumadhwaja: Pushpapura being reached, (or taken) all provinces will be in disorder undoubtedly."

It is therefore certain, that Pataliputra was taken by the Greeks, under Menander, who reigned B. C. 100 to 140 B. C., and who assumed the wheel symbol of the Chakravartti Rajas or Paramount Sovereigns, as may be seen on his coins.

It appears therefore, that after the murder of Brihadhratha, and a brief period of troubled time, during which the rebel and regicide Pushpamitra, exercised some sort of rule over Magadha; the Paramount Sovereignty of Madhyadesa, passed to the Yavana Kings.

Let us now go back to the Vishnu Purana, which specifies 8 Yavanas as at some time or other rulers of India. Assuming that these Yavana Kings refer to Menander and his successors, (and as there have been no other Yavana Kings; (for the Kaila Kila Yavanas have been already identified, see Cunningham arch Rep. Vol. XVII), we have no option but to accept this assumption or reject the Vishnu Purana entirely (as well as the Matsya Vayu and Bhagavata Puranas which here all corroborate the Vishnu Purana). We have the following names. (Cunningham's coin's of Alexander's successors):

Menander.
Amyntas Nikator.
Hippostratus Soter.
Artemidorus Aniketos.
Apollophanes Soter.
Telephus Euergetes.
Hermæus Soter.

The last of whom Cunningham places about 140—120 B. C.; and several of them as contemporaries.

This however, will not satisfy the requirements of the Hindu Puranas, which unanimously record the reigns of 8 Greek Kings.

I do not profess to be able to solve, or suggest a solution of the difficulty. That Harmæus was succeeded by (or was at least joint ruler with) Kujula Kadphises, there appears absolutely no possibility of doubting; and the supposition of General Cunningham that the conqueror of Artabanus II and of Phraates, was this Kujula Kadphises, is at least as certain, for Khiu tsiu ki, the conqueror of Kophene and Parthia, the Kujula Kadphises of the coins, is the only Tochara conqueror of Parthia. But as Mithridates II, the successor of the defeated and slain Artabanus, instead of being defeated, was victorious over these Tochari, and not only drove them eastwards, but actually took some provinces from them; (at least Strabo's reference to his acquisitions can only be referred to this period) it is equally certain, that Khiu tsiu ki could not possibly have *reigned* fifty years after defeating the Parthians, and yet have retained the title of conqueror of Parthia: on the contrary, the Tochara King, who *ceded* provinces to the Parthian Mithridates II, could scarcely have been called the conqueror of Parthia. I am forced therefore to disagree with the opinion of my revered teacher, in refusing to consider Kujula Kadphises, as having reigned so long, that his sons reign must probably be fixed at 80 to 60 B. C.; rather I maintain; that Kujula Kadphises died, after his victory over Artabanus, and before the war with Mithridates II; (this does not however, necessarily imply the rejection of the Chinese record which fixes his age at his death at 84 years.) And that, it was his son, Yen Kao Ching, (who in the absence of a more likely name must be the Wema Kadphises of the Coins) who, driven from Parthia, was forced to put an end to the Grecobactrian kingdom, which appears for some time to have been

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ruled over jointly by Greek and Tochara Kings; and, in the flush of success, to advance into India. How far they went what direction they took, are they the people who found their way down towards Guzarat? What is their relation to the Maha Kshatrapasas, and to the Shahan Shahi Devaputras? are all questions of exceeding interest, but quite outside the province of the Bengal Survey.

As a speculative theory I may say, that I have a conviction, that the expulsion of the Greek conquerors of India about 57· B. C., was the occasion of the establishment of the Vikrama Samvat.

Of course the attack by the Tokhari, under the Kadphisian dynasty, of the Greek Kingdom in Bactria, would amply explain the statement of the Astronomer Garga, that "the fiercely fighting Greeks, will not stay in Madhyadesa, there will be a cruel dreadful war in their own kingdom, caused between themselves." When the main strength of the Greeks had been drained away from India, by this war in "their own kingdom," the remnant would not have been so very difficult to expel. It is to their expulsion, and to the establishment of some other Paramount Indian Sovereignty, that I would ascribe the establishment of the Vikrama era, beginning 57 B. C.; but the records we possess, are yet too vague, for definite conclusions, nor is there much hope of Archlæoogical research in Bengal, throwing new light on the subject; though it is probable, that research in Malwa, and the Panjab, will give us fresh and unexpected light, on this exceedingly obscure period of Indian History.

But although a nameless king, whom tradition calls Vikramaditya, (which is merely a title and need not necessarily be a name and probably for this reason not found in the old Puranas.) established a new Era; presumably, according to my theory, by the expulsion of the Yavanas; his and his successors' sovereignty, lasted but a short period.

There is no lithic or numismatic, or even written record of a definite and reliable kind, of the universal reign of the King who established the Vikrama era; but tradition, all over the entire extent of Nothern Central and Eastern India, is so unanimons in ascribing to him universal sovereignty as a Chhatrapati raja; that it is impossible to ignore his reign. I consider therefore, even if this great King did not himself expel or help in expelling the Yavanas, that, after their expulsion as Paramount Sovereigns of India; the paramount power fell for a brief period, into the hands of a Chhatrapati King (Kshatrapasa of the Sah Coins) about B.C 57; and as a speculative theory, I advance the supposition, that the Khsatrapasa, and Mahakshatrapasa Kings, of whom the first

Nahapana, reigned somewhere about 57 B. C. but whose own inscription has not yet been found, (though coins have) is the Vikramaditya of Indian tradition, and that he was a Tochara or Yeuchi prince: in this connection I quote Edward Thomas' remarks on his Coins (Gupta dynasty p. 31 32.)

"The engraver or designer of this die, was evidently more conversant with the outlines of the Bactrian alphabet, than he was with the forms of the character of the concurrent system of writing of Indian origin. The repetition of the letters of the name of the King, in the latter alphabet, retain so much of the appearance of Bactrian writing, that at first, I imagined the line of the legend, followed uniformly on to the left of the Semetic version of the leading name; whereas there is an obvious break in the continuity of the legend, and a complete reversal of the run of the alphabetical signs, a system of definition equally maintained in the coin of Chashtana (No. 7) where, on the other hand, the Bactrian characters were subordinated, and evidently left to the mercies of Indian die-cutters trained in the conventional schools of their own land."

"It is interesting to observe the conjoint employment of the two local alphabets, in concurrence with the fading lines of the Greek, and the retention on both these coins, in a subsiding degree, of the Bactrian system of writing which marks its erratic spread into Surashtra, following probably the line of the Indus downwards from Bhawalpur, hitherto the lowest point to which its presence could be traced with any degree of certainty."

Of course Magadha and Anga, and all Bengal, acknowledged the sovereignty of this great King, whoever he may have been, for his tradition extends with a persistency, and a universality all over Northern India, which obtains for the reign of no other monarch of the post-heroic period; but the Paramount Sovereignty did not long remain in his dynasty: the establishment of the Saka era appears to me conclusive proof, that a new race (of Scythians) came into India, and wrested the Sovereign power for themselves about A.D 78. This new race of Kings must be the Kanishka dynasty of Indoscythian Kings; and instead of reckoning the dates of the Kanerki Sovereigns from the Seleucidan era, which they were most unlikely to have adopted, I would reckon their dates, in their own inscriptions, from their own era the Saka era; which none but they could have established, on their attainment of Suzerain power in India.

No better test of the result of doing this can be selected than their own inscriptions, which are numerous; and for convenience, I select the list of dates given by Cunningham (p. 43 Indian eras.) which give the earliest and latest dates of the inscriptions of each King.

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Kings' dates from their Inscriptions.	Result by Vikrama era.	Result by Selencid era.	Result by Saka era.
Kanishka.			
Earliest date... 9	B. C. 49 ...	97- 98 A. D.	A. D. 87.
Latest do. ... 28	B. C. 30 ...	116-117 A. D.	A. D. 106.
Huvishka.			
Earliest date... 33	B. C. 25 ...	121-122 A. D.	A. D. 111.
Latest do. ... 51	B. C. 7 ...	139-140 A. D.	A. D. 129.
Vasudeva.			
Earliest date... 83	A. D. 26 ...	171-172 A. D.	A. D. 161.
Latest do. ... 98	A. D. 41 ...	186-187 A. D.	A. D. 176.

It is admitted that the Vikrama Samvat give dates too early, but I fail to see in what respect the Saka era gives dates less reliable than the Seleucidan or "too late" as Edward Thomas says in his Gupta dynasty page 17. The dates derived from the Seleucidan, are those which Cunningham adopts.

That the Greek dynasties of Ariana would adopt the Seleucidan era, can be well understood; but that a barbarous Horde of Scythians, who must have found the Greek kingdom *as a kingdom, already not existent*; (having been admittedly overthrown by the Kadphisean Tochari) should deliberately adopt an extinct era, with which they were unfamiliar, and which, for them, possessed absolutely no significance, is to say the least, improbable.

But when the Scythians are made to use an era, which presumably they had no concern with; (for as has just been shewn to be highly probable, the Vikrama era was the one in use in India, during the rule of their predecessors, the Mahakshatrapasa Paramount Sovereigns) and to leave unused, the one era, which, going by their name, ought to have been in use by them, nay to have been inaugurated by them; because an absurd record (Albiruni, Reinaud) says that the Saka era, their era, was established on their expulsion; I am reminded of the similar record, in regard to the Gupta era, by no less a writer than the same Albiruni: and in giving credence to the one, as to the other, a grave mistake has I believe been committed.

The error of Albiruni's statement in regard to the Gupta era, has been abundantly proved by General Sir Alexander Cunningham, who has nevertheless, fallen into an error, of precisely the sort, that he has himself exploded. It is not in a

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spirit of cavil that I venture to differ from the opinion of one, at whose feet I have acquired such little beginnings of Archæological knowledge as I possess, nor do I underrate the authority of Edward Thomas; but there is now no recorded instance (except the one under discussion) of any known era, having on its establishment, been named after an extinguished or outgoing dynasty; and there is no reason for supposing such a departure from universal practice, in the case of the Saka Kal.

That Edward Thomas and General Cunningham, have been led to adopt the Seleucidan era as the era in which the Kanerkian Scythic Kings dated their public records, is, as Edward Thomas says, due partly to the circumstance, that he (and I know from personal knowledge General Cunningham also) noticed, that though closely approaching to, yet, their dates never reached the 3 figure stage; whence he concluded, that they had adopted the slipshod Kashmiri method of omitting the entire hundreds in the dates of their public records: once admitting this, the adoption of the Seleucidan era gave the only results approaching probability; but it must be evident that the reason for the Kanerkian dates not reaching the 3 figure stage, was due to the fact, that their empire did not last long enough. Even Cunningham implicitly admits this, when he says, that, (Coins of Alexander's successors part II p. 28). "For some years he probably ruled in peace, until about B. C. 128, when the Su or Saka Scythians, under Vonones and Moas, being driven from Bactria towards the South, took possession of Kabul and Ghazni. I suppose that Hermæus may then have applied for aid to their powerful enemy the leader of the Tochari."

For if the Tochari and the Sakas were enemies, and the former expelled the Sakas and themselves advanced some way into India; (and there is no doubt of that) it is obvious that the Kanerkian Scythic dynasty cannot be a continuation of the Kadphisian Tocharic dynasty; they must stand by themselves, as an independent dynasty, and their founder so far as their Indian Sovereignty is concerned, would be the great Kanishka in 78 A. D., which would give for his first record of Samvat 9th dated in his own Saka era, the date 87 A. D. which agrees very well with Cunningham's own date of 97-98 A. D. derived from the Seleucidan starting point, and suits better, the last known date of this dynasty.

Remembering that Chandagrupta I, who initiated an era of his own in 166 A. D., must have been in some sort, a Suzerain Monarch of India; the throwing forward of the last Kanerkian date, from 176 A. D., which is obtained by reckoning it on the Saka basis, to 187 A. D., which results from calculating it on the Seleucid basis, is a wrong move. It is more probable,

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that Chandra Gupta expelled the Scythians in 176 or 177 from Mathura, after having expelled them, and assumed the title of Maharajah Adhiraja in 166 in the Gangetic doab ; than, that he should remain idle, till 187 or 190 ; to complete their expulsion. His scythic war lasting 10 years, is more probable, than its lasting 20 to 24 years ; I think it therefore, very much more probable, that Chandra Gupta I expelled the Scythians from the Gangetic doab about 167 A. D., and inaugurated the Gupta era ; completing their expulsion, probably on the death of Vasudeva, at the close of 176 A. D.

Summarising the results obtained so far, it appears, that, Anga and Magadha and in all probability Banga were ruled by Yavana Sovereigns for 90 years from 147 B. C. to 57 B. C. ; then by the Chhatrapati (Maha Kshatrapasa) dynasty, (the Vikramadityic dynasties of Indian tradition,) from 57 B. C. to 78 A. D., 135 years ; and from 78 A. D. to 125 A. D., 47 years by the Scythic Kanerkian dynasty : From 125 A. D., the Sovereignty so far as *Magadha and Anga are concerned* again passed to native rulers. The foreign domination accordingly lasted 272 years, in this part of India ; but was not finally driven out from India till 176 A. D. that is after a total period of 323 years. In round mumbers the foreign rule lasted in India for 3¼ centuries.

I say 125 A. D., and not 166 A. D., because I place Maharajah Sri Gupta's accession at 125 A. D., for reasons which will be given further on, and because it appears to me that Pataliputra was the Capital of India at least as early as 250 B. C., and continued so down to Fahians time.

The embassy sent by Fan Chan King of Foonan entered India by the Bay of Bengal and reached the Capital after ascending the Ganges 7,000 li *, * * The King who rules here has the title of Maou Lun" * * The Suburbs of the fortified City in which he resided "are watered by rivulets which flow on all sides and fill the deep ditches surrounding the City, below it flows the great river, all the palaces are covered with Sculptured inscriptions and other ornaments in relief, a winding street forms a market 1 li in length, the dwelling houses have several stories."

(Chinese accounts of India translated from "the deep researches into ancient monuments by Matwan Lin." Book 338 Vol. 14. J. A. S. Vol. 61. Lond Journal As Soc. for July-August 1836.)

The embassy was sent between 222 and 280 A. D., and the description is so clearly and unmistakably that of Pataliputra, that further proof is superfluous. Compare Hiouen Thsang and Fahians accounts, Megasthenes in Arrian and Cunningham Vol. XI. Pataliputra being the Capital of India as early

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as 250 B. C. and continuing so, it is most probable that it was the Capital also of Maharajah Sri Gupta and if so it is evident that Maharajah Sri Gupta must have expelled the Scythian Governors from Patna, and from the East of Patna, before he could fix on Pataliputra as his capital; that is to say he must have driven them out of Anga and Magadha by 125 A. D. His Kingdom extended certainly over Gorakhpur; as we know from Itsing that he built the "China" Temple for some Chinese pilgrims who visited his kingdom, and the site has been identified by Cunningham with the ruins of an old Temple near Bulliah, in Gorakhpur; how much further his or his sons Kingdom extended, does not fall within the province of the Bengal Survey.

It is only just possible that Anga may have been ruled by the Naka King mentioned in the Vishnu Puran, as the Vayu Puran says "the nine Naka Kings will possess the city of Champavati (Bhagalpur) and the seven Nagas the pleasant city Mathura" but against this is the *fact* of the discovery of the Coins of 9 Nagas in Padmavati, and the editor's (Fitzedward Hall's) note p. 218 Vol. IV, Vishnu Puran: and I think it may safely he rejected as an error. In passing I may note that the recently discovered initial point of the Gupta era, will necessarily alter the dates of the Naga Coins also, bringing them forward, and that the ascription of the first Naga King to 57 A. D., the initial point of the Saka era, and the assumption of his elevation to power by the Sakas as a tributary prince, does not appear likely to dislocate any well established dates.

The accession of Maharajah Adhiraja Chandra Gupta to Sovereign power being now dated to 166 A. D., the initial point of the Gupta era, (Cunningham Indian eras) the accession of Maharajah Sri Gupta cannot be placed very far from 125 A. D. But the succession of the various later Guptas is so involved, that before taking up the Gupta dynasty, it will be well to give a list of the Guptas compiled so far as, I can from all available sources, with such tentative dates as to me appear to suit known facts, giving my reasons for so arranging and dating them. Along with the Gupta series necessarily comes in also a list of the Varmmas of Magadha their contemporaries.

First then as to arrangement. The succession of the first 7 Gupta Sovereigns, from Maharajah Sri Gupta to Skanda Gupta, is absolutely certain from their inscriptions, and needs no furthur discussion.

I have inserted a Deva Gupta between Skanda, and Budha Gupta, on the authority of General Cunningham, supported as appears to me by Mr. Smith's paper in the Journal As. Soc. Bengal for 1884. According to Mr. Smith a coin, the legend

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on the reverse being Sri Prakasaditya, (which is Cunningham's reading for the older variant readings, and which reading is accepted by Mr. Smith) "resembles the mintages of Chandra Gupta II and Kumara Gupta"; he however goes on to say that in weight it approaches the coins of Nara Gupta; evidently therefore, on numismatic evidence, Prakasaditya must come in, either just before, or just after Budha Gupta. But Cunningham reads a coin, which he considers, (probably on numismatic evidence) ought to follow Skanda as Deva Gupta; and he has so placed him in his latest arrangement of the Gupta Kings Vol. X p. 126.

It is unlikely that 2 different Gupta king's names, just about the period of Budha Gupta's time, are missing. It is known that the Guptas assumed various titles; as Vikramaditya, Mahendraditya, Kramaditya, &c. And as Mr. Smith has apparently read only the title on the reverse, the obverse being defaced, Cunningham and Mr. Smith appear to me to have read, on different coins, the one the name, the other the title of the self same king. Accordingly I have joined the name and title together, and inserted a Deva Gupta Prakasaditya after Skanda Gupta. I may remark, that the gap between the death of Skanda in 319 A. D., and the last known date of Budha Gupta in 108 odd of the Gupta era corresponding to say Circa 350 A. D. appears long, and needs curtailing by inserting this doubtful Deva Gupta; with title of Prakasaditya.

Of Budha Gupta's successor Tathagata Gupta, we know little beyond the fact of his succeeding Budha Gupta, and building a Sangharama in Nalanda, from Hiouen Thsang. As the Chinese traveller is always very careful and accurate in his accounts; I unhesitatingly accept his authority, for inserting Tathagata Gupta, after Budha Gupta; on his authority also I insert Vajra Gupta, as the successor of Nara Gupta Baladitya, of whom however we know nothing, beyond the fact stated by Hiouen Thsang, that he built a Sangharama in Nalanda.

Of Nara Gupta Baladitya, there are several coins, on which Nara Gupta has been read by Cunningham; which he fills up to Narayana Gupta; he is evidently the same King, whose name is read as Nara Gupta by Thomas and Smith. The title of Baladitya is found on the coin which Cunningham reads as Nara, and fills up to Narayana, as well as on Thomas' and Smith's which they read as Nara only. Vishnu Gupta Chandraditya is placed following Nara Gupta. It will be seen that the later Guptas, have an uninterrupted succession, for many generations, and his coins will not admit his being identified with Vishnu Gupta II in the 7th to 8th centuries; besides which, his title of Chandraditya, would entitle him to a place along with, and immediately following, the earlier Guptas, who all bear titles ending in Aditya.

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Of the following Guptas, the Afsar inscription carries the succession down to Aditya Sena Deva; the only point needing remark is my insertion of Narendra Gupta Sasangka Deva, between Madhava Gupta and Aditya Sena Deva.

In the Afsar inscription, the succession is perfectly clear, down to Madhava Gupta; then comes a hiatus, in which a name like Hashka, can be read in Rajendra's transcript: As the stone is much worn here, and the impression is consequently very defective here, the name is as likely to be Narendra as Hashka, especially as no such name as Hashka, is known from any records, while it is clear from the record of the cutting down of the Bodhi tree, in Mahabodhi, that Narendra Gupta Sasangka must be placed before Aditya Sena. It is however just barely possible that Sasangka Deva Narendra Gupta is not at all of the Northern Gupta family; for Hiouen Thsang calls him King of Karna Suvarna, and Karna Suvarna is not Anga: but Beal, in a note, says he was King of Gauda; on what authority I cannot ascertain: (Hiouen Thsang Vol. I. p. 210 Beals transl.) and it is scarcely probable, that the King of Karna Suvarna, supposing Karna Suvarna to be somewhere near Bara Bazar as Cunningham supposes; (Geogr: Ane: India) or as I now particularly locate it, on the banks of the Suvarna Riksha; (Arch reports Vol. VIII.) would be powerful enough to conquer Magadha from a King, who must certainly have been related to the great Harsha Varddhana family of Kanoj; and to do which, he must have passed through the territories of the King of Anga. At the same time it is but fair to state, if only to express myself unconvinced, all the possible arguments against his being King of Anga, which included as a dependency, Gauda, and Karna Suvarna; and the most plausible argument is to be found in the Katha Sarit Sagara. There it is said that King Mahasena sent messengers to the King of Hansadwipa, asking his daughter in marriage for his son; and these messengers embarked at the city Sasangkapura of King Mahendraditya. The name Mahasena is strangely familiar to us, as Mahasena Gupta, and Mahendraditya reminds us of the titles ending in Aditya, borne by the Gupta Kings. But as Mahasena must have been King before Sasangkas short reign, and Sasangkapura must have been founded by Sasangka, who must have been then dead; (as the reigning King is called Mahendraditya, there is a serious want of the congruities of time in the story, which must preclude its acceptance, as in some sort throwing valuable light on the subject under discussion.

The only other record which could have supplied the name exactly, is the Barnarak one; but here unfortunately the same hiatus occurs; the name itself is missing, only the following word Gupta, remains. Cunningham himself admits p. 75 Vol. XVI "As the son of this Gupta is mentioned as Aditya Sena, I have not hesitated to suggest Madhava before Gupta, as this is the name of Aditya's father in the Afsar inscription."

But as will be seen on reference to Vol. XVII Journal as Society, this is very doubtful; a name appears to me to intervene between Madhava and Aditya Sena Deva; and apparently Dr. Rajendra Lala thought so too: I cannot therefore accept Madhava Gupta, as Adityas father, when, in addition to the difficulty just noted, there is the necessity of finding room for Narendra Gupta Sasangka before Aditya Sena.

My own doubt is not in placing Sasangka before Aditya, but in his other name of Narendra Gupta. The Seal in Rohtasgarh, clearly gives his name as Caçangka Deva; and I am aware of no lithic authority for calling Caçangka, Narendra Gupta: As however several authorities, all concur, for reasons unknown to me, in making Narendra Gupta an alias of Sasangka: and there is, so far as I am aware, no grounds for rejecting their ipse dixit on this point; I accept it; with the proviso, that it is Caçangka Deva, whatever title future research may shew him to have possessed, whom I regard as Aditya Sena Devas predecessor.

Of course further research may shew that Caçangka did not belong to this family of Guptas at all, but to some hitherto unknown contemporary line;—if so, of course the list will have to be corrected, but this is scarcely likely.

The succession from Aditya Sena is absolutely certain from the Barnarak inscription.

On the succession of the Varmmas, a few words are necessary.

The succession of the first three is fixed by the records of the Barabar Caves.

The Asirgarh Seal, (Journal R. As. Soc. III., 378, Journal As. Soc. Bengal V. 482) gives the succession of the next five Varmmas. Whether any others have to be inserted between Ananta Varmma, and Harivanuma, is doubtful; no names, which appear to belong to such a place, have yet been found.

The last of these, Sarvva Varmma, is followed by Avanti Varmma in the Barnarak inscription, and he by Graha Varmma (who Marries Rajya Sri sister of Harsha Vardhana of Kanoj.)

The necessity of following him by Sri Varmma, is found in the succession of their contemporaries the Guptas; Mahasena having fought Sri Varmma.

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From Hiouen Thsang we learn, that at a conference, Harsha Varddhanas elder brother Rajya Varddhana was teacheroursly killed by Sasangka.

Bana mentions a Kshetra Varmma as killed by treachery.

The Varmmas were Kings of Magadha, and none of them except Kshetra is known to have been killed by treachery.

That Sasangka held Magadha as suzerain King is certain. The probability is, that he invited the Magadha king, with whom he was at war, and over whom he must then have obtained important successes, and his relative Rajya Varddhana the king of Kanoj ; to arrange about a peace, and treacherously murdered them. Purnna Varmma necessarily follows Kshetra Varmma as he was the King of Magadha, who restored the Bodhi Tree, shortly after Sasangkas return of his own Kingdom. Bhoga Varmma, King of Magadha must follow Puruna Varmma ; as his probable date is fixed by the recorded circumstance in the Nepal Inscrns, (Archæol rep. XVI) of his marriage with Aditya Sena's daughter.

The positions of Deva Varmma and Mala Varmma are fixed by their dates from Chinese records.

Yaso Varmmas date from the Raj Tarangni, makes him follow Mala Varmma, so Jayanta Varmma follows Yaso Varmma. As the Gupta dynasty of East Magadha appears to have ceased with Savitri Gupta, and I know of no other successor of Yaso Varmma, I conclude that the Varmma who was King of Gauda was also Yaso Varmma's successor in Magadha and Anga.

Hari Varmma is a name, which occurs in an inscripn. in the as Soc. mus: J. A. S. Bengal Vol. VI. as a King of Gaur. I do not see any place for him in the Magadha list if his date, which is simply Samv. 32 he reckoned with the Sri Harsha era giving 666+32=638 A. D. He must then have been only a King of Gauda. But as we know Purnna Varmma was then reigning in Magadha, and Aditya Sena in Anga he cannot even be that, but he may belong to the Bhaskara Varmma family of Kamarupa. But by reckoning his date from the Balabhi era (as it is known the Varmmas did use the Balabhi era) he is placed in his proper position following Ananta Varmma, and I have accordingly so placed him.

So much new matter has been added by recent research, which puzzles even experts ; and as will be seen, even General Cunningham's most recent lists of the Kings of East and West Magadha, needs so much modification, that I should be simply perpetuating the vicious mystery with which Archæological research is shrouded, by the numismatic prolix uncertainty, and palæographic intricacy of some Archæologists; or by the unfruitful critical verbosity on monumental architecture of others ; (of

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whom the brilliant author of the 4 closely printed volumes of the History of Architecture, and sundry other octavo quarto and folio works, is the typical and highest exemplar) were. I to pass it all over, by a bare allusion, and a bald statement, which few experts would contradict, and fewer outsiders understand or attack. For Bengal which has been entrusted to my charge, I have tried so far as my very limited knowledge will permit, to continue the good work begun by Sir Alexander Cunningham in his last few volumes, which throw a flood of light into the obscure corners of the Archæology of Bengal; and I am sure that in continuing his work, in the spirit in which he as it were bequeathed it to me, I shall be doing, what must be the intention of him, at whose feet my little handful of knowledge, after sixteen years of apprenticeship, has been acquired. As personal vanity will not permit me to think myself quite a blockhead, I have come to conclude, that an undesirable mystery, has, some how or other, been instrumental in prolonging my term of apprenticeship; and to determine that so far as my humble efforts will avail, no future apprentice will have to pass such a long term as fifteen years in apprenticeship, when every other science, or art needs but an apprenticeship of but five to ten years.

With these remarks on the succession of names, I now append the list of Guptas and the parallel list of the Varmmas, and follow it with my reasons for differing from General Cunningham.

TABLE OF THE REIGNS OF GUPTAS AND VARMMAS.

GUPTAS.			VARMMAS.	
Dates General Cunningham.	Dates Mine.	Names.	Names.	Dates.
100	125	Maharaja Sri Gupta.		
133	140	Ghatot Kacha.		
166	166	Chandra Gupta I (married Kumari Devi).		
200	200	Samudra Gupta with the titles of Parakrama, Apratiratha (married Datta Devi).		
230	230	Chandra Gupta II titles Sri Vikrama, Vikramaditya SinhaVikrama (married Dhruva Devi).		
260	260	Kumara Gupta titles Mahendra Sinha, Ajita Mahondra Mahendraditya Deva.		
296	296	Skanda Gupta Kramaditya.		
319	219	Deva Gupta (?) Prakasaditya.		

GUPTAS.			VARMAS.	
Dates General Cunningham.	Dates Mine.	Names.	Names.	Dates.
326	326	Budha Gupta.		
	356	Tathagata Gupta.	Yajnya Varmma ...	319
	380	Nara Gupta Baladitya.	Sardulla Varmma ...	330
	410	Vajra Gupta.		
	425	Vishnu Gupta Chandraditya.	Ananta Varmma ...	335
			Hari Varmma (married Jaya Swamini ...	350
475	450	Krishna Gupta.	Aditya Varmma (married Harsha Gupta) ...	400
500	470	Harsha Gupta.	Iswara Varmma (married Uma Gupta) ...	430
525	480	Jivita Gupta.	Isana Varmma (married Harshini	460
550	500	Kumara Gupta II Pratapa Deva.		
			Sarvva Varmma ...	500
575	525	Damodara Gupta.	Avanti Varmma ...	525
600	550	Mahasena Gupta.	Griha Varmma (married) Rajya Sri ...	550
625	575	Madhava Gupta Bhava Deva.	Sri Varmma	570
	595	Narendra Gupta Sasangka Deva.		
			Kshetra Varmma ...	590
650	610	Aditya Sena Deva (married Kona Devi).	Purnna Varmma ...	610
675	675	Deva Gupta Karna Deva (married Kumara Devi).	Bhoga Varmma (married Aditya Sena Deva's daughter)	650
			Deva Varmma ...	670
700	695	Vishnu Gupta II (married Ijja Devi).	Mala Varmma Chinese records make him reigning in 692 ...	690
725	725	Savitri Gupta reigning in 758 Archll. Repts. Vol. XVI. page 68.	Yaso Varmma ...	720
			Jayanti Varmma ...	780

The reasons for placing Maharaja Sri Gupta further forward in time than 100 A. D. have already been given, but it may be added, that Itsing, the Chinese pilgrim, records, that 500 years before his time, Maharaja Sri Gupta, built a temple for Chinese pilgrims. (Beals Hiouen Thsang Vol. I Introd. p. x). Itsing's date is about 670 A. D. and 125 A. D. is nearer the date deducible from his account, which is in round numbers; than 100 A. D. The throwing forward of Ghatot Kacha's reign is a natural consequence.

From Chandra Gupta to Budha Guptas accession I adopt Cunningham's dates, and refer to his Indian Eras and his Arch rep. Vol. X for a statement of the reasons for the adoption of these dates.

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But although on Skandha Gupta's death, the inauguration of the Balabhi era, shews, that that part of his kingdom became in some sort independent; there is evidence to shew, that Skandha Gupta's successors, continued to be Paramount Sovereigns; for Maharaja Drona Sinha acknowledges his installation by Budha Gupta, even though, he and his two predecessors, had issued coins in their own name. In Magadha too, although there is no doubt that the Varmmas exercised kingly power, the Guptas continued to be Paramount Sovereigns, as Baladitya Nara Gupta built and endowed the great Temple of Nalanda and defeated and imprisoned Mahira Kula when he invaded Magadha: Caçangka Deva Narendra Gupta and Aditya Sena Deva also undoubtedly possessed Magadha in addition to Anga and Karna-Suvarna, and probably Bengal and Tirhut; while the presence of the names of Deva Gupta, Vishnu Gupta, and Savitri Gupta, in the Barnarak inscriptions, indicate their Paramount Sovereignty in Shahabad, and by inference in Magadha and Anga.

I conclude therefore, that the Varmmas of west Magadha held their Kingdom in some vague sort of subordination to the Paramount Sovereigns the Guptas, right down to their extinction, so far as we now know, with Savitri Gupta; inturrupted only, for a few short years, during Harsha Varddhana's reign, who by Hiouen Thsang account, was Paramount Sovereign over Purnna Varmma of Magadha.

It is worthy of note however that Aditya Sena Deva the King of Anga is not mentioned by Hiouen Thsang as a vassal of Harsha Varddhana. Though too weak to enforce his suzerain rights over Magadha, it does not appear that he ever became, himself, a vassal of Harsha Varddhana; while we know, that after Harsha Varddhanas death, he certainly succeeded in recovering his hereditary power over Magadha.

Budha Gupta was immediately succeeded by Toramana, in Eran, as shewn by the inscriptions there. Cunningham places Toramana's accession in 356 A. D., which I accordingly adopt for Budha Gupta's death, and his successor Tathagata Gupta's accession; this would give for Nara Gupta Baladitya's accession 380 A. D., which agrees very well with the probable date of Mihira Kula, who must have begun his persecution of Buddhists, after Fa Hian had passed through the Kingdom of Udyana. (Beals note 119 Vol. I. Hiouen Thsang says it must have taken place after 400 A. D.) And as after the persecution, he invaded Magadha, and was taken prisoner, and subsequently released; Baladitya must have continued to reign till about 410 A. D. I accordingly place Vajra Gupta his successor's accession at 410 A. D.

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Krishna Gupta's date is fixed approximately by his being a contemporary of Aditya Varmma, who married Harshá Gupta, probably a daughter of Krishna Gupta, as Harsha Gupta was his son: Aditya Varmma was the son of Hari Varmma, of whom there is an inscription dated Samvat 32. (Journal as Sec. Bengal IV. 167) where Bhava Deva II the minister of Hari Varmma digs a Tank, builds a superb Temple, and sets up an image of Vishnu, in a village on a wild and lonely road in Rarha Desa, in Samv. 32:—referring the dáte to the Balabhi era, Hari Varmma must have been reigning in 350 A. D. As however three previous reigns of Yajnya, Sardulla, and Ananta have to be accounted for from 319 A. D. (Skandha Gupta's death) to Hari Varmma; I have placed Hari Varmma's accesssion at the latest possible date of 350; and his sons' accession cannot with much probability be brought down lower than 400 A. D. nor his death much beyond 430 A. D. Krishna Gupta's accession consequently cannot well be brought lower than 430 A. D. I therefore adopt for him a date earlier by 45 years than Cunningham. Vishnu Gupta's accession is consequently dated at 425.

Isana Varmma's date is fixed by his coin on which Cunningham read a date 155, (Vol. IX Arch rep.) which he subsequently supposed to be 257; but 257 would be an impossible date, while 155 with the Balabhi era would fix his date about 473 A. D. His accession might therefore be placed anywhere between 450 and 470 A. D.

But Griha Varmma married Harsha Varddhana's sister, Rajya Sri. As Harsha's father, Prakasa Varddhana died in 598 A. D.; supposing him to have been 75 years old at his death, and Rajya Sri to have been born, when he was 22 her birth could not be dated back beyond 545, nor her marriage beyond 560 A. D.; nor could Griha Varmma, her husband's accession, be put back beyond 550 with any great degree of probability.

Between Griha Varmma's accession in 550 A. D. and Aditya Varmmas in 400 A. D. is a period of 150 years, with 5 reigns: which gives 30 years to a reign; this is certainly as much as can possibly be allowed; these are however the lowest probable limiting numbers, based on absolute, or all but absolutely fixed data; and though high, I have no option, but to accept, and to employ the 30 years, as the average length of reign of the 5 reigns, (which are also generations) of Aditya, Iswara, Isana Sarvva and Avanti Varmma; bringing Isana's accession to 460 A. D., which agrees very well with the date on his coin.

But Isana was a contemporary of Kumara Gupta II. (Afsar Insc.) consequently Kumara Gupta's accession would have to be placed before 490 A. D. on the average calculation. As however this would give the exceedingly small average duration of 16

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years per reign for the 5 previous reigns from Vajra Gupta in 410 A. D. I give Isana Varmma a long reign from 460 to 500 A. D. and date Kumara's accession in 500, thus making them contemporaries for just about a year; (Isana may have been killed in the battle with Kumara for aught we know to the contrary) this would give a result agreeing with the previously assigned date of 430 for Krishna Gupta.

Narendra Gupta Sasangka died shortly after destroying the Bodhi tree. This he must have done after murdering Rajya Varddhana, Harsha Varddhana's brother and his relative Kshetra Varmma of Magadha in 607. Rajya Varddhana reigned 9 years therefore he ascended the throne in 598 A. D. (Cunningham Vol. I Arch. rep. also Hiouen Thsang's narrative of events. Beals Hiouen Thsang Vol. I). And Sasangka had been reigning some time previously.

Giving an average of 25 years per reign from Kumara Gupta II, Narendra Gupta Sasangka Deva's accession, falls about 600 A. D. but as he was actually reigning certainly in 598, I propose to place his accession in round numbers in 595 A. D. and his death in 610.

Between Griha Varmma's accession in 550, and Kshetra Varmma's murder in 607 A. D. is 57 years for 3 reigns; 19 years per reign. For the sake of simplicity therefore, I place Sri Varmma's accession in 570 and Kshetra Varmmas in 590 A. D. This will make Mahasena Gupta for the last 5 years of his reign the contemporary of Sri Varmma as required by the Afsar inscription.

Harsha Varddhana's accession being placed at 607 A. D., his expedition to Magadha, to avenge the murder of his brother, cannot well have been undertaken till 610 A. D.; by which time, Sasangka was dead. Purnna Varmma's installation by Harsha Varddhana, I would accordingly place in 610 A. D.; which agrees very well with the date derived from Hiouen Thsang.

Cunningham places Deva Gupta's accession in 675 A. D. in which I concur; this gives Aditya Sena Deva a long reign of 65 years; he must consequently have been a minor when Harsha Varddhana undertook his expedition eastwards, and sufficiently accounts for the mighty Aditya Sena Deva, of later years, not opposing Harsha Varddhana.

Bhoga Varmma, the son-in-law of Aditya Sena Deva, could not have been installed as King of Magadha during the great Harsha's life. As Harsha died in 648, I take it, that on his death, Aditya Sena Deva at once took possession of the Suzerain power over Magadha, and installed Bhoga Varmma his son-in-law King in 650 A. D. Deva Varmma's date is fixed by Itsing,

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he was King in the time of Itsing, *i.e.*, between 690 and 700 A. D. (See Jorn. R. As. Soc. XIII. 571, 572). By placing his accession at 670, and his successors at 690 A. D.; he is made a contemporary of Itsing. His successor, Mala Varmma's accession, cannot be placed much more forward than 690 A. D. as he was actually reigning in 692. (Pauthier Journal As. p. 1837, p. 405).

Yaso Varmma's date is fixed from the Raj Tarangini, as well as his successor Jayanti Varmma's who is spoken of as King of Gauda not of Magadha. As however the first of Palas, Gopala is placed at 815, and as I can find no names to follow Savitri Gupta, among the Guptas, unless the semimythical Mahendraditya of Sasangkapura be placed following Savitri Gupta, I provisionally conclude, that Yaso Varmma on the death of Savitri Gupta obtained the paramount power; and if Jayanti was his successor, bequeathed it to him.

From Jayanti's accession to Gopala's accession in 815 A. D. *as fixed by Cunntngham*, there is no necessity for looking for any other King, as 35 years for Jayanti's reign is not beyond the range of probability.

These Sovereigns were succeeded by the Pala dynasty. The Guptas disappear from Archæological record, and of the Varmmas, only one branch perhaps remained in Nepal. It is possible the Mahoba Varmmas were a branch of the same Varmma family, but on this point all is conjecture.

As I accept Cunningham's list and dates of the Palas, with the exception of Gopala's initial date, I simply refer to his reports, especially Vol. XI. And append his list.

Gopala Deva	...	...	815 A. D.
Dharmma Pala	...	...	830 „
Deva Pala Deva	...	...	850 „
Rajya Pala	...	...	885 „
Sura Pala	...	...	887 „
Vigraha Pala	...	...	900 „
Narayana Pala	...	...	915 „
Raja Pala	...	...	940 „
* * * Pala	...	...	965 „
Vigraha Pala II	...	...	990 „
Mahipala	...	...	1015 „
Naya Pala	...	...	1040 „
Vigraha Pala III	...	...	1055 „
Mahendra Pala Deva	...	...	1085 „
Rama Pala Deva	...	...	1110 „
Madana Pala Deva	...	...	1135 „
Govinda Pala Deva	...	...	1161 „
Indradyumna	...	...	1185 „

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Indradyumma being driven out by the Muhammadan invasion.

Regarding Gopala's initial date, I cannot disregard the double testimony of Taranath and of Ferishta, who give his reign a length of 45 and 55 years respectively; giving him a reign of 55 years, and not altering the date of his successor Dharmma Pala, his accession is thrown back to A. D. 785. As we know that Savitri Gupta was actually reigning in 758 A. D. and admitting my conjecture, that Yaso Varmma seized the Suzerain power on Savitri Gupta's death, Gopala would be his successor in Anga, and in all probability in Magadha. And Jayanti Varmma would, (after a conjectural rule as Suzerain King over Magadha, Anga and Bengal, for the brief period of 5 years) he relegated to his proper position as the King of Bengal alone (as mentioned in the Raja Tarangini) from 785 A. D. forward.

I have already given grounds for regarding the Guptas, as not only Suzerain Kings holding a sort of Suzerain power over Magadha, and Kirana Suvarna, and Bengal, but as more especially, Kings of Anga. In fact, it is extremely probable, that Maharaja Sri Gupta's successful revolt against the Scythic Governors of Pataliputra, began in Anga, probably in Bhagalpur itself the Capital of Anga, and though Pataliputra was the capital of the earlier Guptas, I think there can be little doubt, that from Krishna Gupta downwards certainly, the capital of the Guptas was not Pataliputra but Bhagalpur or some place in Anga; as not only the more important later Gupta inscriptions, come from Anga, but the tradition of KarnaDevaDevaGupta (the Karna Dahariya of tradition) having rebuilt or built the fort of Karangarh in Bhagalpur; and of the more modern Dharahra being so named after him, (or is it *vice versa*?) establishes the fact, that the Guptas had their head quarters in Anga. At the same time, the circumstance of the earlier Pala inscriptions, and records, (copper plates being found in Bhagalpur in Mongir and elsewhere eastward) confirms the view, that they, during the earlier part of their dynastic ascendancy, ruled their empire, from Bhagalpur, or some place adjacent. The ancient fortress of Kherhi, with its extensive ruins, and its inscriptions in the yet unread shell characters of the 8th and 9th centuries, probably points to its having for sometime, been the seat of Government; and the traditional fortress of Indradyumna in Hasanpur near Lakhiserai, with the great stupa and monastery of Indappe, (a contraction of Indrapura so named possibly from Indradyumna) point to a similar conclusion. At the same time, there is absolutely nothing to shew, that after "the bank of the River Holung gave way and disappeared," "at the close of the years Kan Yuen,"

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(A. D. 750) a catastrophe which refers to the swallowing up by the Ganges, of old Pataliputra, (see Journal As Soc. Bengal VI. and Journal Roy As Soc. Lond. 1836 also introduction p. XII. Vol. VIII Archl. reports). Pataliputra ever again became the seat of Government. Yasovarmmapura. (Behar) did enjoy the distinction probably of being the seat of Yaso Varmma's Kingdom, after the Ganges had swallowed up Patna; and I would consequently date its foundation to 750 A. D., or thereabouts; and therefore during Yaso Varmma's reign; who, thus deprived by a catastrophe of his capital, would be forced to build a new one as mentioned by Taranath, by whom the foundation of Yasovarmmapura is ascribed to Yaso Varmma. After his time however the entire weight of probability tends to fix the centre of Government in Anga or at the outside, on the western boundary of Anga, as its most westerly position. Close examination (with exploratory trenches) of the mounds at Bhagalpur at Kherhi, at Dharahra; in Sultanganj; at Kahalgaon, at Rajmahal, in Monghyr; and in Hasanpur, Rajjhana, and the vicinity of Jamui, (Indappe) can alone inform us of the successive changes of the seat of Government, since the great catastrophe to Pataliputra in A. D. 750, compelled its abandonment as the capital of the Varmma Kingdom, after it had some time ago ceased to be the capital of the Suzerain Monarchs the Guptas.

I have now brought the outline of the political history of Anga, so far as recent research enables us to ascertain it, down to the close of the Hindu dynasties with Indradyumna, but before proceeding to the Muhammadan rule, a few words in regard to the caste of the rulers of the Kingdom will not be out of place.

The Sovereigns down to Karna are of the Lunar race. Karna himself is said to be a son of the Sun, but rejecting this myth, he must probably be reckoned a Sudra (the sons taking the caste of the mother) as he was descended from the Sudra wife of Vijaya's father.

The Barhadhrathya dynasty who next ruled appears to me to be of the Lunar race.

The Pradyotas appear to me to have been Brahmans.

The Sisunagas must probably be regarded as of the Solar race, though the mother of the first Sisunaga, was a courtesan. See Turnour page XXXVII. He was however, on the fathers side, of Royal descent, being the son of a Lichchavi Raja (of the Solar dynasty of Ikshvaku) while his mother, though a courtesan, is said to have been of one of the first families in Wesali, appointed to the post of Chief Courtesan, for her great beauty; as though it were intolerable that such great beauty should be monopolised by any one man!

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Chandra Gupta was not a Sudra by any means, as Cunningham on slender grounds conjectures ; the most detailed account we possess of the rise of Chandra Gupta, is given in the Tika to the Mahawanso, and we there learn, not only that Chandra Gupta was not a Sudra ; but that he was very far from being an ordinary man ; he was the son of a Brahman of Takshasila, in the Panjab ; learned, skilful, dexterous in policy and intrigue, and known "as a highly gifted individual, worthy of swaying the Chhatta" (Turnour Mahawanso p. XXXIX).

The Maurya dynasty was succeeded as we have seen by the Paramount rule of Yavanas, Tocharas, and Sakas successively ; then comes the rise of the Guptas.

That Maharaja Sri Gupta was not a sudra as Cunningham says, is abundantly clear from his descendant marrying into the Solar Lichchavi family. I conclude therefore, that the Guptas were certainly Kshetriyas, though not probably of the Solar race: this would account for Chandra Gupta on his coins parading his marriage with a Lichchavi princess. Possibly they were descendants of the original Lunar Kings of Anga. It does not appear to me to be at all true that obscure individuals (except in such a very rare case where Genius and Opportunity combine as in the Corsican Napoleon, or the Indian Chandra Gupta) ever succeed in raising themselves to the Royal dignity, anywhere, least of all in India ; where social rank and influence, and consequently political power, is conferred by "blood" and neither by wealth, nor except in the rarest of cases, by talent. And however heterodox it may sound in these days, when every man, almost as an article of his creed, believes himself the equal of every other man, notwithstanding differences of birth and blood ; I maintain the substantial correctness of my statement, and I appeal to Indian History for the fullest confirmation of my sweeping assertion as regards India. Of course it will be understood, I exclude Muhammadans from my statement ; and further ; in descending to modern times ; the tremendous disintegrating power of the foreign domination of an alien (and as regards rise to highest power) an intensely democratic race must be allowed for: the substantial equality of all true believers is the political foundation of Muhammadanism, and the reason of its gigantic and rapid rise and progress. The Oneness of a Great Power, apart from, and utterly unreachable by the Jamaat of believing equals, is only a necessary Corollary to the *fundamental vital proposition that all are equal*: but this by the way.

It now only remains to ascertain if possible, the caste of the Palas.

The Tomar dynasty of Palas beginning from Anang Pal which ruled Delhi and Kanoj rose to power about 736 A. D. (See Archl. rep. Vol. I p. 145). That Delhi was their Capital for several reigns, there appears to me to be no doubt; but at some uncertain period, the Capital was removed to Kanoj: when this was done, is uncertain; but as Bhoja Deva was reigning in Kanoj, as well as his successors, probably without interruption, till the defeat and death of Jaya Pala in 1021 A. D.; I infer, that this move eastward, took place, shortly after the accession of the Tomar dynasty to Supreme Power in N.-W. India. As Bhoja Deva was reigning in 862. I would assign this move eastward to say 800 circa or thereabouts.

Now it is remarkable, that a dynasty bearing the same distinctive appellation of Pala, as the great Tomar Dynasty, rose to power in East India, within a few years of the rise of the Tomar dynasty, in Western India; and that this rise of the Pala dynasty in East India, corresponds even more closely with the move eastwards, of the Tomar dynasty of the Palas of North-West India. I infer therefore, as, much more probable, than Cunningham's supposition, of the sudden and unexplained rise of an unknown sudra to Supreme Power; that a scion of this powerful family, aided in all probability by the forces and wealth of the reigning head in Delhi or Kanoj, came down eastwards, conquering the eastern Kingdom from the Varmmas; and established himself as Supreme Sovereign. His name being Gopala or Bhupala. And founded the Pala dynasty of East India.

If my suppositien be correct; and every consideration of probability is in its favor, the Palas of East India would not be Sudras or Bhumihars but Tomar Rajputs.

Unfortunately, there is no such detailed record of marriages in the various inscriptions of the Pala dynasty, as would enable us to establish the caste of the Palas by means of the caste of the princesses they married, with the exception of the one regarding the marriage of Vigraha Pala, to the Haihaya Princess Lajja Devi: as the Haihayas were Kshetriyas, it is evident that Vigraha could not have been a Bhuinhar Babhan, but must have been a Rajput. A Bhuinhar Babhan, even though a Raja, (as Tikari whom Cunningham cites as an instance) *neither claims for himself, nor is ever permitted, or admitted by the people for a moment, to pass himself for a Brahman.* If then the Palas were Khsetriyas, as appears certain from their marriage with the Haihaya Princess, the probability of their being a branch of the powerful Pala dynasty of Tomaras of North-West India, is confirmed.

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Of the caste of the Varmmas, who have been mentioned along with the Anga Kings of the Gupta dynasty, a few words here will save reference and repitition in future. Cunningham has established that they are Mauryas, and consequently in all probability descendants of the great Maurya dynasty, This would account for their rise to power on the decay of the Guptas, though it is not too much to suppose, that they were powerful, though not independent princes (owning only the Suzerainty of the Guptas) even during the reign of Maharaja Sri Gupta; and that they had helped him in his revolt, and in driving out the Saka Governors.

As Chandra Gupta was a Brahman, it appears that the Varmmas must be considered Brahmans also. It is true they are recorded to have married two Kshetriya princesses; one the sister of Harsha Varddhana a Rajput, another the daughter of the great Aditya Sena Deva, probably of the Lunar race, and certainly a Kshetriya; but as a Brahman may marry a Kshetriya wife without loss of caste, and such marriage redounds, rather to the glory of the Kshetriya family so honored; I can readily understand, that the powerful and Suzerain Kings Aditya Sena and Harsha Varddhana, rather plumed themselves on having secured Brahman husbands for their daughters, even though these husbands were, in a manner their subjects.

There is a version of the rise of Chandra Gupta which makes him out a descendant of the Ikshvaku line; and therefore a Kshetriya (see Turnour p. xxxix.) but I have preferred the version which brings him from the Panjab, as it is countenanced by the classical writers DiodorusSiculus, Justin, and Plutarch; all of whom say Chandra Gupta actually met Alexander in his youth; the version which makes him a native of the Panjab would admit of this, while the version which makes him a Sakya prince will not; but further, the *aid* he got *from Parvatendra* the Mountain King, and his army of *Mlechhas and Barbarians*—(another authority says *Yavanas*) confirms the version which brings him from the Panjab.

It is worthy of note that the last of the Nandas who lost the empire, was the son of a Sudra woman. And therefore himself a Sudra: compare this with the conquest of Anga by the Magadha Kings, about the time, when Vijaya, also the son of a Sudra mother, reigned over the Anga Kingdom.

We have now arrived at the close of the Hindu rule in Anga; and it remains to trace, so far as possible, the fortunes of Champa, (Bhagalpur) and incidentally of Anga, of which it was the Capital, during the Muhammandan period.

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The mention of Bhagalpur during the Muhammadan period is unfrequent and meagre; no doubt because, at the time of the Muhammadan invasion, it had ceased to be the Capital of the province.

The earliest mention that I can find of Bhagalpur is in Humayuns time (Elliott VI.) "When he (Humayun) arrived at Bhagalpur, he divided his army and sent Mirza Hindal with 5,000 men over the river to march on that side."

After Humayun, in Akbar's reign, Bhagalpur is mentioned several times.

When Khan i Khanan invaded Bengal during the reign of Daud Khan; (King of Bengal before he took Garhi;) "he had previously made himself master of Surajghar on the Ganges, about 80 miles from Patna; of Mongir with the help of Raja Sangram of Gorakhpur, and Puran Mal Raja of Kidhur; and of Bhagalpur" (Elliott V. 381 note).

In the Military revolt in Bengal during Muzaffar Khan's Governorship, brought on by Akbar's attempt to enfore his new fiscal system; the rebels, among other places, took Bhagalpur; and when Todar Mal, who on receipt of the news of the revolt, had been appointed Governor, (in place of Muzaffar killed by the mutineers) reached Mongir with the imperial forces, he found the rebel army of 30,000 cavalry encamped at Bhagalpur, ready to give him battle. As Todar Mal declined to risk everything on a pitched battle, he entrenched himself in Mongir and in time after several skirmishes in the vicinity of Bhagalpur, succeeded in wearing out the patience of the rebels; who straitened for provisions by Todar Mal's policy of conciliation of the local Hindu Zamindars, and of ready money payments for provisions; (which diverted the entire food supply from the rebels to his own troops) made a dash in two parties for Patna and Behar in hopes of surprising these places. (Stewart) A. D. 1580.

Khan Jehan, after the death of Munaim Khan, was ordered to Bengal as Chief, Todar Mal being superseded and placed under him as 2nd in command; he was met by the Bengal Amirs and Chagatai nobles at Bhagalpur. (Blockmann Ain i Akbari.)

When Man Singh was appointed Governor of Bengal and Behar, he assembled his forces at Bhagalpur, preparatory to marching down through the Santal country to Bardwan, on his way to West Orissa from the Afghan rebels.

In the fiscal system of Akbar, we find from the Ain i Akbari, that Bhagalpur was only a Mahal (district) in the Sarkar of Mongir in the Subah of Behar, paying a revenue of 4,696,110

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dams (about 117,500 rupees.) It was the seat of a Faujdar; an office held during the reign of Shah Jehan, by one, Atish Khan Dakhini; it is also noticed in the Maasir i Alamgiri, as the residence of Shekh Kaziuddin one of the compilers of the Fatuha i Alamgiri. It continued to be the seat of a Faujdar right down to recent times. It was here, that Suraja Daula in 1757 directed Law to await his orders, to march down to Murshidabad, when hostilities with the English were imminent; but the order for the march, arrived too late; and Law had not passed Teriagarhi, when news of the battle of Plassey reached him, and he returned to Bhagalpur. Had he marched on to Udhwa, 20 miles further; he would have met, and saved his employer, who was seized in the vicinity of Rajmahal.

From here on the news of the advance of the English, Law started for Patna, just 4 days before Major Coote's arrival on the 15th July 1887. It is worthy of note that when Major Coote left Bhagalpur on the 19th, in pursuit of Law; the "Governor" as Orme calls him, (Faujdar probably) sent after him as auxiliary, a body of 60 horsemen, under command of his son; it is clear consequently, that Bhagalpur not only submitted to the English with a good grace, but that the submission was a willing one: possibly the license of Law's irregulars had a good deal to say to the welcome the English received (Orme Vol. II).

Bhagalpur is also mentioned in Taverniers travels; who notices 3 rivers between Jangira and Bhagalpur, which he specifies as the Ronova, the Tae, and the Chanan: The Chanan is the Chandan, which joins the Ganges close to Champanagar; the Ronova is the Banrooah, which now joins the Chandan, and has no independent outflow except occasionally; I cannot identify the Tae river.

On the East, after passing Bhagalpur the traveller mentions the Katare river, which must be the Kataree of modern maps; but it has now no independent outfall, it joins the Ghogha river and both combined flow into the Ganges close to the Ghogha station.

I append the entire passage as the book is now difficult to procure. Tavernier Vol. II Ch. VIII.

Le premier jour de Janvier 1666, apres avoir vague deux heures je vis le *Gaudet* entrer dans le Gange and qui vient du Nord. C' eft une grande riviere qui porte bateau.

Ce soir-la le gite futá Zangira, Cosses 8.

Mais comme le Gange ferpente fort toute cette journee, on fait bien par eau Cosses 22.

Le 2 depuis les six heures du matin jusques vers les onze je vis trois rivieres entrer dans le Gange, and elles viennent toutes trois du cosse du Nord. La premiere s'appelle *Renova*, la seconde Tae and la troisieme Chanan.

Le 3 apres quatre heures de chemin sur le Gange, je tronvay la riviere de Katare qui vient du Nord, and vins coucher ce jour-la a un village appelle *Pengangel* au bout des montagnes qui viennent jusques au Gange, Cosses.

More recent travellers have occasionally visited Bhagalpur—and from among the occasional notices scattered here and there, I cull the following:—

Francklin in his "researches on the tenets and doctrines of the Jeynes and Boodhists" p. 99. Alludes to some Jain Temples in Champanagar. Describing the Temples on the Parasnath Hill he says. "These temples in shape, very much resemble an extinguisher; in them is to be seen the Vasu Padukas, or the sacred feet, as is seen in the Jeyne temple at Chumpanugger."

I quite agree with Francklin in his simile, and the temple alluded to is quite modern, and devoid of interest as a specimen of ancient Architecture; and only succeeds in displaying the utter degradation of the Art of Architecture in modern times in India.

Lieutenant Thomas Bacon in his first impressions in Hindostan, Vol. I gives a pictureqe view of the "ruins at Bhaugulpore" I recognise them as meant for the now ruinous buildings at the entrances to the famous Bhagalpur caves at Mayaganj near Barari, but the buildings have since his time, considerably decayed, and the greater portion fallen; and a view now would not be nearly so picturesque; he also alludes to two round towers, which, if they do not mean the ugly spires of the Jaina Temple, I have been unsuccessful in finding; he says.

"Before quitting this village Patarghur" (Patarghar he has told us in p. 281, is "a small place" "about a mile to the N.-W. of the capital." I cannot find the village however). "I must not omit to mention two very extraordinary round towers which are by tradition said to have been built by a company of the Jhaina caste, who travelled from Mysore in the latter part of the thirteenth century. This account has some support beyond mere tradition in the circumstance that the towers, which are held very sacred by the Jhains, are similar in structure to those found in many parts of Mysore, more particularly as Sravana Belgala."

If Lieutenant Bacon's memory has not misled him as to the location of Patarghar, these Temples would be the most important remains above ground in Bhagalpur, and would be so interesting

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and important, that though my inquiries and search has failed in the past, it is worth trying for again.

Major Archer, aide-de-camp to Lord Combermere though he describes some of the ruins of Rajmahal says nothing of interest about the antiquities in Bhagalpur.

Bishop Heber visited Bhagalpur and mentions the Cleveland monument, but no other.

Hodges the artist also visited Bhagalpur but I can find nothing of interest in his quarto volume, about Bhagalpur; though he gives an interesting account of a beautiful waterfall some miles off: but I have been unable to lay my hand on his folio volume of plates which may contain something.

Emma Roberts in her charming volumes, has nothing about Bhagalpur, though she gives a picture of some antiquities nearabouts, which will be noticed in their proper place.

None of the other travellers that I am aware of, have anything of interest about Bhagalpur.

Nevertheless there are many objects of interest above ground in Bhagalpur even now. These are noted as Nos. 1 to 9 which I proceed to notice; premising, that the greater portion by far, of what is of interest in Bhagalpur, has yet to be brought to light by exploratory trenches.

No. 1 is a Masjid known as Shah Chamas, near the fuel and small-log market, in Bhagalpur; it stands on a raised platform about 5 feet high, and has a "Madrasa" and a well attached. The open raised terrace in front of the Masjid is paved with grey sandstone slabs. The Masjid proper at the West end of this terrace is an ordinary looking one of probably the 17th century; the entrances are small, and the interior, divided off into convenient square compartments, are covered over with domes. An inscription in black stone, No. 102, Bengal list, is let into the panel in front of the Masjid over the central arch, and is said to have been taken from the Imambara of Rasul Khan, now demolished. As however it merely contains sentences from the Koran it is of no interest. The building is in good order, often whitewashed, and has apparently its finances in a flourishing condition; beyond the circumstance of the building being rather superior to the usual run of such buildings of recent times, there is nothing of interest about it, and as access is denied, it is neither possible nor necessary, to furnish any plans or drawings, of what is only one of a very ordinary specimen of the later Muhammadan Architecture.

No. 2. Is a pretty building, with its numerous domes and spires, standing on a revetted terrace, overlooking the river, in the grounds, and indeed in the compound of my friend Babu Surjya Narayan. The building is said to be the Mausoleum of a local Magnate, Mirza Ibrahim Husain Khan, whose great grand son Mirza Muhammad Husain Khan, is now alive, and a resident of Bhagalpur in reduced circumstances: he is said to have been a Faujdar of Bhagalpur, and I should say the last one, before British annexation; it must have been he who assisted Coote with 60 horsemen under command of his son in his pursuit of Law; but as Orme does not mention the name of the "Governor" this is a conjecture.

The building is a pleasing one, and has some peculiarities of construction, which deserve illustration; as it is easily accessible and in good order, the necessary details will be secured and appear in part II of the Bengal reports.

Within the grounds of Babu Surjya Narayan Singh, and close to this Mausoleum, have recently been dug out, several black basalt monoliths, which, from their size, and shape, and sculpture, must be Muhammadan, and used to support the cloth canopy over some sacred tomb now disappeared; I may note that the building in whose compound these monoliths have been dug up, used to be occupied by the rulers of Bengal, in days, when Darjiling had not become the summer head-quarters of the local Government. There are also 2 old cannon, (and 2 others were carried off recently) with an inscription which alludes to a Hindu Victory; and a fragment of another on the river revetment, (which must once have been battlemented and defensible) the cannon are said to have seen service in the battle at Ghoga Nala, in the days of Alivardi Khan Mohabat Jang, when he was attacked by Mustafa Khan.

History says nothing however of a battle between Alivardi Khan Mohabat Jang and his dismissed and rebellious general Mohabat Jang. Stewart merely says that an invasion of the Maharattas (the 5th I count it) took place about 1748 A. D. and they were joined by the rebels, when a skirmish took place near Bhagalpur, between them and Alivardi Khan, who on the news had hastened up to Mongir: I have no doubt this is the battle referred to in the tradition—but the inscription mentions Gurhatta and goes on to record the victory of one, a Hindu Maharaja, against the Muhammadans who are there called Yavanas.

Besides these monolithic basalt pillars, which I will presently give reasons for beliving to be converted Hindu material, there have been dug up occasionally, near some huts just at the edge of the compound, blue and yellow glazed-tile fragments and Babu Surjya Narayan on excavation discovered a stone

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platform which he conjectured rightly to be the remains of a Masjid, as the foundations of one of the flanking towers of the central archway still exists, being an octagon of 20 inches side, and on examination of the spot, I find distinct traces of massive foundations; I conclude therefore that a Masjid, and a Darga, which must date to the time of the independent Muhammadan Kings of Bengal, existed here; the basalt pillars doubtless formed the supports for the complimentary embroidered cloth canopy, similar to that stretched over the tomb of Mir Qutab Alam in Hazrat Pandua, a, these pillars resemble the pillars in the shrine of Mir Qutab Alam (see Ravenshaw pl. 28) but as these pillars are rather taller, I would ascribe the building of the Masjid and Darga to about the same period within 50 years, *viz.*, during the reign of Syad Husain, who reigned under the title of Alauddin Husain Shah, from (A. D. 1498 to 1520 A. D. according to Stewart) A. D. 1493 to 1529 according to Cunningham on the authority of his coins, which range from 899 to 926 A. H. which however correspond to 1493 to 1520 A. D. so that Cunningham's 1529 is probably a mistake for 1519. A. H. 926 began on December 23rd, 1519, and must have run through nearly the whole of 1520 A. D. (see Vol. XIV Arch rep. and Indian eras) and I accordingly accept 1493 to 1520 as his correct dates of accession and death.

Alauddin Husain Shah certainly built the great Masjid near the railway station presently to be noticed, and was evidently very religiously inclined, Stewart says, he settled a grant for the support of the "Tomb College and Hospital of the celebrated Saint, Kutb ul Alam, which are continued to this day." And also that "He built public Mosques and Hospitals in every district, and settled pensions on the learned and devout."

I have no hesitation in ascribing the monolithic pillars and the destroyed Darga and Masjid to him.

In the same compound has been dug up, and now lies close to the well, and close also to the exhumed monolithic pillars, one architrave and a lintel of beautifully smooth black stone, precisely similar to the material of the pillars, but sculptured with the elegant scroll work, which appears to have been a characteristic of the sculptured work of the Guptas. It is difficult to judge of the period of a building from a specimen of the sculpture alone, as no pillars have been dug up; but at least this much can be asserted with certainty, that the buildings which were destroyed in Bhagalpur of which the exhumed lintel and jamb are fragments, was of the same period, as the temples which furnished the material for the magnificent central niche of the great Adina Masjid. That more may be found where these have been, appears to me probable, as the mounds on which the house and the tomb

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stand and one or two still unoccupied mounds, are in all probability mounds inhuming the ruins of demolished Hindu buildings.

Object No. 3 is as said in the list, a Jain Temple—but it can scarcely be 200 years old, the Jains however make such difficulty in admitting any one, not a Jain, into their temples, (in Bengal even more than orthodox Hindus) that it was with the greatest difficulty, I could obtain admission into the court yard, after pulling off my shoes; and as there was really nothing of interest, except some thin plate-gold chirags beaten into the form of the fabulous 7 hooded shake on long rods, and a barbaric display of gold and jewels, I much regretted, exposing myself to a cold through wet socks, to the vile smells of the court, and to the insolence of the temple servants.

The Jain Temples have however been noticed by more than one traveller, though I can scarcely believe that Lieutenant Bacon's note (see ante) can have reference to the modern ugly whitewashed structures which are a type of about the lowest degradation architecture can descend to. Francklin's note (see ante) is the earliest notice of the Jain Temples that I can find; I can only suppose that the known wealth of the Jain community, their barbaric exclusiveness and intense bigotry, and intolerance, their peculiar tenets and their absurd pretensions, have invested their temples with a sentimental interest, which, as objects of art they do not deserve; when I find travellers in possession of their senses, going into extacies over the miserable sentry boxes on Parasnath hill or the commonplace buildings at Mandar or Pawa, which, if they had been built by the much maligned Hindu, would I suspect have formed the text for a homily on the æsthetic turpitude of the Hindu mind.

Object No. 4. Consists of 2 Masjids, of which the one in Mulla Chak is of some interest not only from it size, but also from the inscription on the old gateway leading into its court; the inscription No. 101 is of "Ala-ul-duniya Wa-ul-din Ab-ul Muzaffar Husain Shah Muhammad bin Shah Mahmud Hasan," but I fear the date has been wrongly read as 959 A. H., as Husain Shah ceased to reign in A. H. 926, and the Muhammadan Kingdom of Bengal, ceased to have even a nominal King, with the capture on the battle field of Rajmahal, in A. H. 984, and the subsequent death of Daud Shah: and I can find no name corresponding to Husain Shah between A. H. 926 and A. H. 984.

The inscription however deserves careful scrutiny. Stewart says of Husain Shah that he was a Syad who "had quitted the deserts of Arabia to improve his fortune in the fertile region of Bengal. His illustrious descent first introduced him into the court of Gaur, where his superior abilities soon raised him to the high dignity of first subject of the empire. The oppressions and brutal temper of Muzaffar made him a rebel and fortune made him a King." Until however the inscription is properly read, discussion on a conjectural reading is worse than useless.

The Masjid which has recently been repaired, whitewashed, and ornamented by broad strips of black, down its three domes, is a building of some pretensions, standing at the end of a paved court yard: I perceived that the kalas and flowers of the minarets on the cloistered walls of the court yard, and elsewhere where spared by the whitewash, were of baked pottery, covered with a vitreous glaze, as usual with glazed tiles; and I noticed red, yellow, blue, green, and a dark blackish tint, among the colors of the glaze, of which portions still adhere; the greater portion of the cloisters have however long since fallen in, and those still standing have been utilised as residences by the Khadims; some being closed from the Masjid side, and doors broken in on the opposite or what was originally the outer side; as they are inhabited, a complete plan would I fear not be obtainable, but a partial plan, a couple of photographs, with possibly one section, would sufficiently illustrate this relic of the last Muhammadan Sovereigns of Bengal.

The manuscript records of the Masjid say it was built about the time when Farokh Seir was Shahzada.

When Shah Yasin Sehwaniya, of Aliganj in the Gaya District, who was a disciple (spiritual son) of Shah Wajiuddin Guzarati, and the spiritual grandson (Shah Wajiuddin being the disciple) of Shah Muhammad Ghaus of Gwalior, went on a pilgrimage to Mekka; he, after much penance and repentence, cried out before the Holy tomb; oh grandfather! and a voice from the tomb replied Ya walidi. This of course made him a Wali: afterwards in a trance, a vision commanded him to make a disciple of a man named Muhammad Deoriya; accordingly, when on his return, he met Muhammad Deoriya, who meanwhile had moved with wife child from Deoriya to Monghyr, he proposed to make a disciple of him; but Mahammad refused, considering it rather more suitable that he should be the teacher and Shah Yasin the disciple; and was only induced to submit, by a narration of the command in the vision to make a disciple of "one Muhammad Deoriya; he was then ordered to go and settle in Bhagalpur, which was overgrown with Jangal; and he came and settled in Bhagalpur; he was born in A. H. 956: in the 5th reign from Humayun the King; he came to Bhagalpur in 986 A. H. and died 1050 in the 16th year of the reign of Shah Jehan.

He was succeeded by his son Maulana Safi Siyal Koti; he by Maulana Muhammad Asim; he by his son Muhammad Abid; and he by his son Maulana Muhammad Muvabid; his son Muham-

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mad Safi; his son Maulana Muhammad Abid urf Shah Nuri; and his, Muhammad Ashraf Alam; successively succeeded to the Gaddi: the last is alive, and receives a pension of Rs. 20 a month from the Government, an amount, to which the original pension has become gradually reduced, from the time of Maulana Muvabid the first pensioner.

Shah Jehan is said to have come here on a pilgrimage in 1035 A. H. Shah Suja also made a pilgrimage to the shrine in 1052 A. H.; Azimusshan visited Maulana Shahbaz in 1112 A. H., and Farokh Seir in A. H. 1122 when the Masjid was built.

It has been a custom of the Gaddi Nashins of this Masjid on no account to travel outside the 27 bigahs of Mulla Chak, except for going to Mecca.

Comment is superfluous!

Object No. 5 is a ruinous Masjid which once was worthy of notice, near Barari. No traditions or inscriptions exist.

Objects Nos. 6, 7, 8. Need no particular description; I will only note, that Cleveland house, built on the great mound, at the foot of which stands the Cleveland monument, is now for sale; and the fact of the monument being there, is adroitly used by the advertisers to enhance the attractions of this desirable property "built before 1780 by the munificence and taste of the illustrious Augustus Cleveland the civiliser of the tribes of the Rajmahal Hills, whose monument at the expense of the East India Company with an inscription on marble from the classic pen of Warren Hastings, first Governor-General, graces the grounds and is an object of pilgrim veneration."

To the Archæologist the chief interest of the mound does not lie in the monument which bears the inscription from the "classic pen" of Warren Hastings, but in the objects buried within: that the site is one of great importance, and of interest, is to me abundantly manifest from the fragments of walls which here and there crop up, above the beautiful grassy slope of the mound; on the East side particularly, are a number of Muhammadan brick tombs, mostly decayed, under and around a fine Tamarind tree; and as the Muhammadans invariably selected the site of a demolished Hindu shrine to locate themselves on after death, the occurrence of these tombs, added to the outcropping of fragments of walls, built of the old, large, Hindu bricks, is to me conclusive evidence of this mound inshrining old Buddhist or Hindu remains: but of course it is vain to hope to explore a mound whereon stands the great rambling two storied house, which at the lowest calculation must be worth several thousand rupees, and is now private property, to say nothing of the associations, connected with its having been built and having been the residence of such a worthy officer, and good man, as Augustus Cleveland.

The river Ganges must once have flowed at the foot of the Temple or Stupa or whatever other object has now crumbled into a smooth surfaced gently sloping mound; at present, a thin stream runs past it for part of the year; it appears to me however that at some period, the mound was a sort of island, as the ground on the landwardside, is, at a short distance off, still very low; could I afford it, I would like to purchase the house to explore the mound.

Object No. 9. Are the famous Bhagalpur caves: they have been noticed by travellers and Archæologists, and the buildings that once stood over their entrances as vestibules, and to protect the caves from rain, (which if it once got in would of course remain in the cave till it got soaked up by the clay, for the caves are in a kind of hard clay,) have been drawn, certainly once, by Lieutenant Bacon in his " First impressions of Hindostan (plate facing p. 282 Vol. I). The best account, to which I can add nothing except that the buildings protecting the entrances have fallen and are falling, and ought to be preserved, by pursuading the owner, (a rich zamindar) to occasionally repair them; is to be found in Cunningham. Vol. XV. I will only add that there are two series of caves; over the entrance of each of which brick buildings have been built, (besides minor ones) of which Cunningham notices only one. I have examined both, and as there is really nothing of interest about the one, not noticed by him, and as it is similarly a natural cavern, in the gravelly clay of the high bank of the Ganges; I content myself by a reference to his very interesting account.

Object No. 23, the fort of Karangarh, has been already alluded to; it is variously ascribed to the Karna Raja of the Mahabharat, and to Karna Dahariya, whom I identify with Deva Gupta Karna Deva, the son of the great Aditya Sena. It is difficult to assign, it with any certitude, in the absence of all exploratory trenches, to either of them; but judging from the bricks, which are 18 inches one way, by over 3 inches thick, I feel that the probabilities are, that the fort belongs to the older Karna, as bricks of over 3 inches thickness, had ceased to be burnt by the time of Karna Dahariya. Hiouen Thsang's mention of it, (and he visited the place before Deva Gupta Karna Deva's accession,) is also evidence in assigning to it a higher antiquity, than the latter end of the 7th century.

Of the subsequent history of the fort, little is known; it must have stood the seige and capture alluded to in the Dasa

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Kumara Charitra, and must therefore have been, not only in existence, but the seat of the Anga Kings, at the period. I can however find no Sinha Varmma in the lists, and am therefore led to conclude, that if a king Sinha Varmma existed, he must have done so during the troubled times between the Gupta fall, and the rise of the Senas; or just before the Muhammadan conquest. As Ananta Varmma is mentioned in the story as having been killed just before the story opens, and there was a real Ananta Varmma, King of Magadha, it might be possible to place the events at that period: any way, it is clear, that when the story was written, about the 11th century, a fort (and that fort the present fort of Karangarh I take it) existed in good order, capable of standing a seige.

That it was not in good order in the Muhammadan period, may be inferred from the circumstance, that during the various operations of the war and invasion, (1) of Bakhtiyar Khiljy, (2) of Baber, (3) of Humayun, (4) of Sher, (5) of Akbars Generals, (6) during the military revolt in Akbar's reign, no use appears to have been made of it; at the same time the skirmishes in the vicinity of Bhagalpur, during Alivardi's rule, and the order of Suraja Daula to Law to remain in Bhagalpur till orders for an advance should reach him, imply some sort of fortified position there, which could be held, and which assured in some measure, the safety of the defenders.

During the British rule, the fort has never been used as a place of defence, but troops were quartered here, and the barracks now empty still exist within the fort in good order and kept up by the P. W. D.

At present, there are two small modern Temples, at the N.-W. corner of the fort; here in the courtyard, are collected a number of fragments of sculpture, among which are to be found figures; entire, and mutilated, of Buddha, as well as figures of the 4 armed Vishnu, of Durga or Parvati, and of Siva. Some fragments of the scroll work lying here, would lead to the supposition that remains of the early Gupta period lie buried, as it is improbable that any one would take the trouble to bring battered fragments from a distance, to throw them down at the foot of the pipar tree in the Temple Court; but the greater number of the fragments, point to the later period of the Pala and Sena dynasties; 9th to 12th centuries. The existence of these fragments within the fort, is however clear evidence, that excavation would bring to light others.

I also picked up, among the rain washed debris of the ramparts, fragments of pottery; both of glazed tile work, and of the primitive black pottery with a natural sort of glaze; the former no doubt comes from the ruins of some Muhammadan Masjid or Tomb, and as the remnants of tombs still exist on the Eastern ramparts, (right on the top of the ramparts not within the fort) it is an indication, not merely of the existence of Muhammadan Masjids and Tombs, but even a clearer indication, that the fort was never used as a fort in the Muhammadan period; a conclusion which I have already deduced from other considerations. The black pottery however is of the kind which is found in the remains of the first two centuries before or after Christ, and is a valuable indication of the existence of very early remains in or near the fort.

Besides these objects of interest in the city of Bhagalpur, mentioned in the Bengal list, there are the following, which have not yet been examined, or only examined very partially. Numbering them in continuation of the numbers in the Bhagalpur Circle, of the Bengal list; they will be:

No. 116.—Shahjangi; Dargah, Tank, and Mounds.

No. 117.—A Masjid in Kazi Chak said to be old.

No. 118.—In Shujaganj Muhalla, Munna Dahu's Masjid.

No. 119.—A Masjid in Mashak Chak.

No. 120.—A Masjid near Shakrulla Chak.

No. 121.—A Masjid near the railway overbridge at Mujahid Chak.

No. 122.—A Masjid in Chauki Niyamatpur.

Of these the Masjid at Kazi Chak, No. 117, is said to possess a dated inscription; it is possibly the one mentioned by Hunter, as having an inscription, which records its erection by Kwaja Ahmad Samarkandi, faujdar of Sarkar Mongir, in A. D. 1622-23; but as I have seen as yet neither it nor any of the following ones. I can say nothing about them.

No. 116 the remains at Shahjangi have however been superficially examined: they consist of a noble tank, which was deepened by the Magistrate during a scarcity, with convict labor, a Government grant, and private subscription; a long inscription in English and Persian, let into the North wall of the West Ghat, not only records the fact, but gives the names of all the more important donors. On the masonry of this Ghat, are set, some old pillars, which are said to havebeen found lying here; they consist of 2 pillars 2 feet 3 inches square and 2 thin granite pillars, 2 dwarf pillars, and of 4 other pillars said to have been brought from Barari; the first 4 pillars, which were found here, are no doubt some of the yield, in the course of time, of the immense mound of brick ruin, which literally forms a sort of high rampart on the West side of the tank, and is undoubtedly Hindu; whether the two dwarf pillars were found here, or brought from elsewhere, my informants could not tell me. There are also pillars let into the Eastern Ghat, which will be mentioned in their proper place.

The long line of mounds, which extends more or less along the entire West bank of the tank, culminates in a Darga at about one-third of the length of the tank from its Southwest corner: the ascent is steep, and some attempt at regular steps had been made at some past period; the Dargah, which is known as the Dargah of Hazrat Pir Shah Jangi, consists of a whitewashed brick tomb, on a massive raised roofless platform, within a small courtyard, inclosed by a niched, and whitewashed, brick wall. The platform is garnished in various places, with strips of sculptured stone, taken from some demolished Hindu building; and a few fragments also adorn the walls; but the doorway on the East, leading into the inclosure is ornamented with the black chlorite sills of some Hindu temple, with elaborate and very beautiful and profuse carving: possibly the smooth lower sill, used as a step, contains an inscription, and sculpture, turned face downward, for the "faithful" to tread on constantly.

Outside the inclosure, remains of old, and very massive walls and platforms, of 12 × 8″ bricks set in mud, literally cover the entire mound, from the foot to its summit; there being no continuous space of 10 or 12 feet, where bricks set and in situ are not found by superficial scratching with a sharp pointed hard bamboo; further to the rear, a long spur juts out far to the West, to a distance of over 150 feet in undulating billows of ruined brick work; and minor spurs jut Northwards and Northwest wards: here, in and about this mound, to a distance of about 200 feet in breadth by 350 in length, the brick remains lie thick, and almost at the surface; to their North and South, there is less of brick work outwardly visible, though the mounds run on, almost the whole length of the tank.

The mounds were visited by my revered Chief General Cunningham, and specially commended to my attention, before his departure, as objects very well worthy of careful examination, whenever the opportunity should occur; they have also been visited by the present Director-General of the Survey, who informs me that he feels assured, the remains are not the remains of a Stupa; no one I guess ever supposed them to be the remains of a or one large Stupa; but it goes without saying, that among the miscellaneous ruins; remains of some *minor* Stupas may be found; and it is perfectly certain, that whether Stupas, or temples, or monasteries; here is to be sought, and found, much valuable information regarding the Archæology of Bhagalpur.

If nothing but Stupas are to be explored, then has Archæological research in Bengal already reached its limits; for Stupas are such conspicuous and easily seen objects, and Bengal is so thickly inhabited by a sharp witted people, ready to take advantage of all available resources, that unlike the backward tracts in the Panjab and the North-West, whose superstition-bound people fear more or less to dig into old mounds, they would long ago have dug up the Stupas and built houses with the materials; and what between Archæological explorers, professional and amateur, and an enterprising body of inhabitants, there are now no Stupas unexplored in Bengal. Except those, which, from the circumstance of being the jealously guarded private property of rich landowners, or the more effectually guarded sites of Muhammadan Dargahs, or of temples, Jain or Hindu still in use, have escaped destruction, not a single Stupa available for exploration is known to exist; and those that exist thus guarded, may be counted on the fingers of one hand, and are not likely to become available for exploration by amateur or professional antiquarians, during this generation.

But a Hindu Temple or a Buddhist Monastery, are as likely to yield valuable information as Buddhist Stupas. And in regard to their value for Architectural Archæology, as apart from their sculptural value, a temple is of greater interest than a Stupa. But to revert to the remains.

On the South banks of the tank, there have been but few buildings, as only a few bricks scattered here and there attest their existence. Similarly on the North bank, few remains exist; but as along the North bank, runs a public road; any remains there, must long ago have been levelled and removed.

On the East bank there now stand 2 longish rows of buildings apparently built for the accommodation of pilgrims, as I could find no one inhabiting them; they are quite modern, and of no interest; but imbedded in the masonry of the Eastern Ghat, are a number of very massive granite pillars, of various patterns; they are nearly 10 feet high, and nearly 2 feet square, standing on bases 2 feet 3 inches square; I could obtain no information regarding them, from the people, beyond the fact, that they had been set up in their present position, on the newrepaired ancient Ghat, during the time the tank was cleared and dug in 1843.

Of the local history of Hazrat Pir Shah Jangi, I could get no details beyond this, that he fought and conquered the infidels. Drawings of the pillars with details will be found in part II of the report.

With this, closes for the present my information of the antiquities in Bhagalpur itself, and I proceed to notice the

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following objects in the District which have been seen by me or of which I possess reliable information.

Object No. 10 of the Bengal list is the remains of an extensive monastery, but it is hopeless to attempt a survey or plan of it, or even to intelligently describe it, without further removal of debris. What is known of it, will be found in As. Soc. Journal Bengal Vol. XXXIII p. 361; and there is also a brief notice of it in one of the Journals of the Royal As. Society; and all the known information will be found collected and summarised in Cunningham Vol. XV. I can add but little to the information, but as nothing further is now obtainable without further research even that little may be of interest.

Lying neglected among the debris is the base of a Toran pillar; I say a Toran pillar, as it precisely resembles the bases of the Toran pillars exhumed in Buddha Gaya, about which there is not the shadow of a doubt; the base measures 2 feet 10 inches square and 13½ inches in height; the mouldings being a fillet of 8 inches in height, a Cyma of 4½ inches, and an upper fillet of 1 inch; the surface of the upper fillet, being 5 inches behind the surface of the lower, in other words the measurement of the base below being 2 feet 10 inches square, the upper square is 2 feet each way; on the upper surface, are 3 socket holes in the middle, in which apparently corresponding tenons of the pillar above fitted.

Besides the base of Toran, the fragment of the pillar of a Toran, is also lying near the excavation. I say one of the pillars of a *Toran*, because on this pillar, there is the same recessed panel for the reception of some flat bas relief, to be secured by bolting, as there is in the corresponding pillar of the Toran at Buddha Gaya; this Toran was apparently a different, and a larger one, as the base of the pillar is 2 feet 10 inches square, and it could not therefore have fitted the 2 feet square upper surface of the base described above; the age of this toran, judging from the sculpture, must be about the 4th century, as it resembles closely the remains at Eran and Besnagar in its style of sculpture, a similar Kumbha pl. XXVII with leaves but little removed from the forms in plate XXIX of the 10th Vol. Archæological Reports, being the characteristics; this would agree fairly well with the date already deduced by Cunningham from the Coins in the Stupa adjacent, and with the date assigned to it by Dr. Rajendra on palæographic grounds. I may note, that the height of the sculptured lower part of the pillar, is 1 foot 11 inches; over which comes a plain surface; the total height to the recessed panel being 2 feet 4 inches, and the recessed panel being 2 feet wide by about 2 inches recess; dimensions which correspond fairly well with the Buddha Gaya Toran panel.

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In the village adjacent is the fragment of a round pillar, similar to the square Toran pillar already noticed.

There is the pedestal of a Statue also lying in the ruins, which must be the pedestal of a Statue other than the copper one mentioned by Rajendra and Cunningham; it has of course a shallow sunk recess on its surface, for receiving the base of the Statue, and, what is not usual, a spout for the outflow of libations; as Statues of Buddha do not receive libations of water, the pedestal must have belonged to some one of the later Buddhist divinities. The pedestal measures 1′ 9″ in length by 5″ only in width, and is of granite.

Several granite slabs of large size measuring 2′ 6″ × 7″, 2′ 6″ × 6″, 1′ 9″ × 7″, and 10 inches in thickness, lie scattered in the diggings; also the remains of a pilaster 1 foot 9 inches across, in front.

Of the excavations themselves all I can say is, that a more utterly destructive excavation it has seldom fallen to my lot to see; it rivals the excavations made by the kanungos deputed by the Deputy Commissioner, to excavate Sirpur. Broadley's much abused excavations in Nalanda, bad as they are, are positively models of careful research compared with these. Not a floor but has been broken, not a wall stands, all that does stand now, is the foundation of the monastery, *below* the floor level; and even these have often been broken in places: as to the courtyard, the level of it was long ago reached and cut through.

But luckily the entire range of mounds had not been excavated; and as, from the apparently unbroken straightness of the Southern edge of the mound, I conclude it to have been the back, while the numerous projections, indentations, and the isolated mound on the North, equally indicate, that on that side was the face of the monastery or Temple; there is hope, that if Government authorise a proper exploration by trenches, the more important portions will be found, not quite utterly destroyed; what have been destroyed beyond hope, are the Cloisters, or Chambers, round the inner courtyard, especially round the 3 minor sides; while the real front is yet buried under rubbish.

I made out, that there stood side by side, two monasteries, each with its court surrounded by Chambers, with Verandahs opening inward into the court; at the North-East corner of the greater monastery, there still stands intact, a high conical mound, round in plan; and at the North-East corner of the second monastery, stands a still higher oblong mound; besides these; the real facade to the North, as well as the outer faces on the other

3 sides, are yet buried, and presumably untouched by the destructive hand of the amateur explorer; and hold out very fair promise of important knowledge of the architecture, if of nothing else, of the period.

About half a mile West from the mound, stands, what General Cunningham calls the fort of Karangarh; it is a mound about 500 paces long by 300 paces wide, surrounded by a moat, which on the South face, is a thousand paces long. I conclude therefore that a large portion of the mound or fort has been already cut away, and levelled, as indeed it must have been, to allow of the Indigovats, and other accessory buildings being built, and a fine broad road being driven on and along the East face; on the North the fortress abutted on the river. The highest point of the mound is crowned by the Baneli house, belonging to the Baneli Raja: at various places in the mound are yet to be seen the protruding tops and ends of brick walls; the bricks being 8 inches in one dimension; probably the usual 13 × 8 × 2½″ which is the size of the bricks in the mound dug into by Mr. Harris.

The fort appears to have possessed one gate or entrance to the West, I could notice no depression corresponding to a gate on the South or on the North river face; on the East, as before said, the outer ramparts have long ago been cut and levelled.

Excavation here is not likely to be permitted, and all that can be done is to note what can be noted from surface indications; I infer that the great mound on which the Baneli house is built, is the ruin of some great Palace or Temple, which for security was inclosed by a rampart and ditch. As the remains here have been ascertained to range to about the 3rd century circa, and as we know the Paramount Sovereigns made Pataliputra their Capital, it appears more probable that it is the remains of a Temple, rather than of a palace, that lie inaccessibly buried beneath the foundations of Baneli house.

A few pieces of sculpture, apparently Buddhist, have been found in the fort, and now lie in the grounds and near the Veranda of Baneli house.

This old fort is not mentioned in the Bengal list and I propose that it be added to the list in its future issue, as No. 123 of the Bhagalpur Circle.

Object No. 11 is sufficiently noticed by General Cunningham in his fifteenth Volume; as all that I can add to the information there contained, properly belongs to part II, it will be found there.

It is convenient before quitting Sultanganj to notice objects Nos. 18, 19 and another object not in the list, a Masjid on the

Baiskaran Hill, close to the Jahngira rock on the mainland, which I specify as object No. 124 ; as they are all in Sultanganj.

Nos. 18 and 19 have been noticed by Cunningham Vol. XV.

It appeared to me exceedingly improbable that such a remarkable place as the Jahngira rocks should not be found in the traditions of the Mahabharata or of the Ramayana or even of the Puranas ; but so it is ; and I can only account for it by supposing, that these remarkable rocks were not in the river bed at the time, and had not consequently become objects of Pilgrimage.

It has been shewn above (Supra p. 48) that about 750 A. D. Some remarkable change took place in the course of the Ganges, by which the ancient City of Pataliputra was swallowed up by the river. The change in the course necessary to do this, is not small ; it means that the river at Patna moved Southward between 2 and 3 miles, and the extent of its move is attested by the great width of the sands at the modern Patna, where, to cross over direct to Hajipur or Sonpur, a sandy island, about 4 miles wide has to be walked across.

I have connected this change with the change in the course of the Son about that period. (Vol. VIII Arch. Reports.)

But such a change cannot take place without affecting the entire river down stream, (and by reflex action later and less materially up stream) with the up stream action, we are not at present concerned, but it is important to trace the probable inevitable change down stream.

In theory, such a change would cause a deviation, first one way for a wave length, dependent on the fall of the river, and on the extraneous (positive or negative) force brought to bear on the current, modified by the resistance of the banks to erosion, by internal friction, and not unappreciably, by the general direction of the flow with reference to the direction of the earth's motion on its axis; followed by a corresponding reflex wave-length ; the wave lengths increasing in amplitude and diminishing, in (height I can scarcely call it, but) deviation, from the original direction, till distance and other causes have dissipated the new energy imparted : there will consequently be waves of deviation to the right and left of the original course with nodes at the points where the deviations crossed the original lines of flow, at which the river would not have altered its position but where the only alteration would be in the *direction* of the current. The difficulties however in the way of the theoretical solution of such a problem are insuperable.

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But luckily in this instance there is no need for such a solution, when the maps give the practical solution of the problem. It will be seen (I refer to Indian Altas Sheets Nos. 103 and 112) that such changes *have* taken place from Dinapur downward, the nodes being at Barh, at Surajgarah, at Mongir, at Jahngira (a little below the city) at Kahalgaon at Sikligali at Rajmahal and at the return bends of Mongir and Kahalgaon; and the direction of the deviations, moving down streamwards, being to right between Dinapur and Barh, to North or left between Barh and Surajgarah, to right between that and Mongir, to left between Mongir and the bend, to right from bend, to Jahngira, to left from Jahngira to Kahalgaon, to right between Kahalgaon and bend, to left from that to Sikligali, and to right or Southward between Sikligali and Rajmahal. The amplitudes of the waves however do not follow the theoretical law of increased length according to the distance from the source of disturbance except in the first two wave lengths, simply because extraneous circumstances, in this case unerodable rocks, impose an absolutely insuperable limit, to the deviations, at Mongir, at Kahalgaon, at Sikligali, and at Rajmahal; and the abrupt turns of the direction and force of the current, bear ample testimony to the fact, that but for the obstacles, the amplitudes would have been far longer and the intensity less. Below Rajmahal this may be seen very clearly where one single wave length reaches down to Godagari near Rampur Bauleah, but this by the way, the further changes not bearing on the subject in hand.

It is now evident that as a node is at a point about a mile and half below Jahngira and two miles below the fort of Karangarh just described, object No. 123, (not the more ancient fortress in Bhagalpur) the river before 750 A. D., must have flowed north of its present course; consequently the rocky islet on which is now perched the Temple of Ajgaibi Nath, would not have been an island, nor would the Baiskaran hill be on the banks of the river. They would be ordinary hills, and rocks, rising out of the plain, in no way different from the numberless others all over this, and every other hill possessing district, and therefore in no way challenging attention, and attaining to sanctitude as remarkable objects; consequently not mentioned among the tirthas enumerated in the Mahabharata Vana Parvan.

It is not as if the Mahabharata did not mention any tirthas in the Bhagalpur district, the Tirtha Yatra Parva, has three separate notices, of some, then very well known, but now utterly unknown tirthas, close to Bhagalpur (Sect. LXXXIV. Pratapa Chandra's trans. of the Mahabharata Vana Parva). "Repairing then to the river Kauçiki that cleanseth from even great sins,

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one should bathe in it. By this, one obtaineth the merit of the Rajasuya Sacrifice. One should next, O foremost of Kings, proceed to the excellent woods of Champaka. By spending there one night, one acquireth the merit of giving away a thousand kine" again. "Proceeding to Champa and bathing in the Bhagirathi, he that sojourneth to Dandāparna acquireth the merit of giving away a thousand kine" again (Sect, LXXXV.) "Arriving at Champa, and bathing in the Bhagirathi, and seeing Danda, one earneth the merit of giving away a thousand kine." The hermitage of Rishyasringa is also pointed out; Mandara is mentioned, and some other places in and near the Bhagalpur district are mentioned, and it appears inconceivable that the hermitage of Jahnu Muni supposing *that it was then traditionally located in the remarkable rocks of Jahngira* should have escaped all notice.

It is remarkable that the characters of the inscription on the boulder in the Island as well as the characters of the few other inscriptions on the Baiskaran hill (See Cunningham Vol. XV. plate XI bear out the date of about 750 as the period when Jahngira became an object of religions attention. The characters it will be seen are of about the same type and age as in the Deo Barnarak Inscription (Cnnningham XVI, plates XXV, XXVI) which he ascribes (p. 68. Vol. XVI) to A. D. 758.

But there is further evidence of the date of the sculptures being about 750 A. D. or later. I find on classifying the rock sculptures; that there are, more or less, out of an aggregate of 120 sculptures, (all there is besides those in the temple).

47 figures of Vishnu including the Rama, Krishna and Vaman inearnations and the Chaturbhuja form.
2 of the fish incarnation of Vishnu.
1 of the Varaha incarnation of Vishnu.
1 of the Narasinha incarnation of Vishnu.
3 of the Parasu Rama incarnation of Vishnu.
2 of the Buddha incarnation of Vishnu.
1 of the Kalki incarnation of Vishnu.
1 figure of a sleeping female which I take to be Maya Devi's.
15 Lingams.
3 figures of Siva with the trisul.
1 „ Siva Naked (obscene).
9 „ of Ganeça.
2 „ of Haragauri.
5 „ of Brahma.
22 „ of Aditya.
1 „ of Ganga very fine.
4 „ unrecognised and broken figures.

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So that there are realy more figures of Surya or Aditya than of any form of any other divinity.

The evidence of the Udigiri sculptures, of Eran, of Pathari and of Afsar, all tend to shew that in the earlier Gupta period, the Varaha incarnation was the form of divinity in fashion; while there is equal evidence from the Garhwa sculptures, and the various sculptures in Magadha, that at least from the great Aditya Sena downward, the worship of Aditya was more in favor; and if one may make a conjecture, I should say that the popularity of the worship of Aditya, was due in no small measure to the name of a favorite, and undoubtedly powerful, Paramount Sovereign, being Aditya Sena; and to the fact of his affecting the worship of Aditya himself.

The circumstance of a single figure of the Varaha incarnation among such a profusion of sculpture, and the great preponderance of the figures of Surya appear to me to indicate, in a very significant manner, the age of these sculptures to be subsequent to the period of the great Paramount Sovereign Aditya Sena Deva. An inference, further borne out, by the scarcity of the figures of Ganga, which in the earlier Gupta period was a favorite subject of sculpture.

I have now I believe shewn, with a very high degree of probability, that the establishment of the Jahngira rocks as a place of pilgrimage and of worship, indeed that their very existence as a rocky *Island*, dates to about the middle of the 8th century; and I call to attention the silence of Hiouen Thsang regarding the rocks here, while he notices the rocks at Kahalgaon, as further evidence in support of the theory.

The present temple which is quite modern inshrines or rather is built over what were evidently previously existing rock sculptures; the object of worship, being a figure of Vishnu, on the Ananta Naga, flanked to the right and left by Brahma on the lotus with his goose, and an obscenely naked 2 armed Siva with his bull.

The picturesque beauty of the Jahngira Temple-Crowned rocks, has attracted the notice of several modern travellers, and a beautiful illustration and a brief notice of it is to be found in Vol. II of Emma Roberts' Hindostan page 78. Major Archer also notices the rocks. Vol. II p. 119. Bishop Heber notices both the temple, and the Masjid on the adjacent bluff; the Artist Hodges also notices it, but though he praises the situation chosen by the Gosain of the Temple, as "A proof of his taste and of his judgment," he passes a very severe, and I think well merited condemnation, on the sculpture; "I am concerned I cannot pay so high a compliment to the Art of sculpture among the Hindus,

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as is usually paid by many ingenious authors, who write on the religion of Bramah. Considering their works as I do with the eyes of an artist, they are only to be paralleled with the rude essays of the ingenious Indians I have met with in Otahiete and on other Islands in the South Seas." He forgot however, that much of the rudeness of the sculpture was due to the unsuitable nature of the rock, a very coarse grained granite, and at least some to the weather and time.

Lieutenant Bacon's account is however the most interesting; he also gives a plate; his version of the legend ascribes the destruction of the original temple (of Harnath Baba ?) which Cunningham concludes was built a century before the accession of Jehangir, to Aurangzebe; Aurangzebe is so well known as a temple destroyer, and the story bears on the face of it such an appearance of truth, that I extract the passage Vol. I page 287."

"All that I could collect of the ancient history of these rocky strongholds, was from an old *Fakhir* in the village; together with comments and other hints by a respectable old Jemmadar, who had formerly served as a soldier under Colonel Skinner. These men informed me, that, during the reign of Aurungzebe, the temple, which has since been rebuilt, was the haunt of a band of *Jogis*, who had made this place their head quarters, and the depot of an immense treasure, the fruits of their extortion. When Aurungzebe marched upon Benares, he detached a small division from his forces against Monghyr, with orders if they were successful in this first object, to proceed down the river to Jehanghira and sack the treasury of the old miserly devotees. The party were fortunate in their execution of these orders, and carried off from the latter place an enormous amount of specie, besides vast numbers of valuable jewels and vessels of gold: the *looht*, or booty, is said to have amounted to fifty lakhs of rupees or £ 500,000 English money. The *Jogis* were driven forth from their hive, and the original temple was partially destroyed; that which now stands upon the island is a modern erection, though built upon the foundation and of the materials of the former one. This fact is borne out by the evidence of the masonry, but for the verity of the details just given I will not be answerable, my information being collected from rather a doubtful source."

There is elsewhere, a somewhat different version of the seizure of the treasure of the Mahants of the rocky Island by order of Aurangzebe, and of the destruction of the temple; but I cannot now recall the authority to my memory.

Hunter in his statistical account has a brief notice of the temple and rock; and it goes without saying that Buchanan Hamilton notices it also; but of all the legends connected with

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these rocks, the most romantic has been thrown into a charming little poem, entitled "The Hermit of Jahngira," by the Eurasian poet DeRozio which I very strongly commend to the notice of those romantically inclined.

Little more remains to be said: the Masjid on the Hill is evidently built on a Hindu Site, and with such Hindu materials as were available, and as it is of no particular interest architecturally, or historically, this brief notice of it is sufficient; there are numerous shallow reservoirs cut on the rocky surface near, and to some way down the hill, most probably by the Hindus; but any mythological rock sculptures there may have been, have long ago been destroyed by the builders of the Masjid, which is itself now in its turn falling into decay; and being of no interest deserves no effort for its preservation.

At Dumraon or rather close to it is a mud fort ascribed to the Khetaura Rajas, there is little now to be seen above ground, but so far as superficial examination shews, the walls appear to have been of mud, surrounded externally; and it will surprise most people, internally also; by a once wide and deep moat; there were 4 round towers at the corners; and outside the moat, at the South-East corner, as well as on the slope of the tower itself, I noticed brick ruins, the bricks being 12 × 8 or thereabouts; the outer mound is certainly a Temple and the roots of a fine tamarind now envelope the bricks of the ruin partially; it is more difficult to decide on the nature of the brick ruin on the slope of the South-East tower, but it appears to me to be the ruins of a Muhammadan Tomb.

The reason of the inner moat is however seen on observing that within the outer inclosure was a second inner line of walls also of earth; between these walls, on the East side, is a low mound burying the ruins of a temple; a gateway in the outer ramparts, gave easy access to the Temple, while a corresponding gate in the inner ramparts facing the temple and the outer gate, led into the inner fort. I could not ascertain the gates on the West face, as the ramparts on that side have mostly sunk down, or been cut away and levelled, for cultivation; but the towers at the four corners, and two in the middle of the longer sides, the East and West, still remain; there were gateways probably on the other two sides also; certainly on the South side, but the present road has cut through the North side, Hunter says there were seven gates which is quite possible if the gates of the inner fort and of the Citadel be included, the outer ramparts had assuredly however no more than four.

Within the second line of ramparts which do not appear to have possessed towers at the corners, is a smaller raised squarish plot, which I guess was the inner fortified Citadel, and I could see that there were brick ruins now crumbled into low mounds within; but the dense Jangal baffled further research.

There are several artificial pieces of water, once square tanks, now merely low roundish ponds, between the inner and outer ramparts; I counted five; on the banks of three of which, once stood buildings (small temples probably) of some kind, of which such small remnants of brick as were not worth carrying away by the villagers, still lie scattered, to attest their former magnificence; while at the outer as well as the inner East gates, a few bricks seem to shew that the gateways were once, more than mere gaps in the earthen ramparts. But the buildings whatever they were, in and about the fort, have all utterly disappeared, and nothing but exploration by trenches will disclose the probable age of the fort. I recommend at least one good trench across the extensive low mound, between the East gates of the outer and inner ramparts, and one in the Citadel. The fort is noticed as object No. 113 in the Bengal list.

The legend regarding the last Khetauri Raja, who fell fighting to the last, in this, his last stronghold, against the Muhammadans, is given by Hunter; but in the absence of exploration by trenches, it is not possible to know what credit to attach to the legend.

At Amarpur or rather near it and to its South-West is a large tank with extensive brick ruins on the South-East corner, and ruins also on the other side. The old ruin is stated in Hunter's Statistical Account, and by tradition, as well as by still existing traces, to have been a Masjid or rather more than one Masjid. Hunter relates the tradition of its having been pulled down by an avaricious zamindar, in search of treasure, of which he found enough to go on carting away to a place of safety for 7 days. I dismiss this as an idle invention of the credulous people of the village, but I accept as a valuable piece of information, the tradition of its having been a Masjid, as the tomb of some important local magnate, still stands adjacent, and has a fine inscription in black basalt let into its outer wall. The inscription has not been read, but I judge from the form of the ornamental Arabic writing that it belongs to about the period of Sultan Alauddin Husain Shah. It is numbered 103 of the Bengal list, and its decipherment is very desirable. In face of this inscription, which appears to belong to the tomb, and I connect the tomb with the now demolished Masjid and Dargah, I hesitate to credit the tradition which ascribes the ruins to Shah Sujah.

The place is called Takht Banahra, it is noticed in the Bengal list as object No. 114.

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On the opposite side of the tank stand the ruins of an indigo factory with a fine flight of steps down into the tank.

A mile and half off the road from Belhar, (where there is an indigo factory) to Katoriya, and about 4 miles from Belhar, are some low hillocks known as Kailas Pahari, close to the Banruah river, and near Matihari village, on the 28th mile Belhar-Katoriya Road, on the old line of road. On and at the foot of these hills, and close to them, in the scrub jangal, are several mounds, exclusive of the ruins or rather traces of brick buildings on the summit of one of the small hills; there are at and near its foot, 3 detached mounds, then further on 3 more mounds separated from the last, but running into each other; after a small space is a row of 3 other detached mounds; lastly a solitary mound.

The first 3 mounds, as well as the 3 mounds which join each other, appear to be the ruins of an old city, where, judging from the occurrence of iron slag, I infer the manufacture of iron from the ore which is found in the adjacent hill, was carried on; these 6 mounds are thickly covered with fragments of pottery rolled pieces of brick and iron slag: the village apparently stood here; they cover a space of about 1,000 feet square.

The 3 mounds beyond these, are however the ruins of Temples; on the main mound, which measures 200 feet long by 100 feet wide, and the sides of which were once supported by ornamented brick revetment walls, of which portions still exist, stood no less than 9 Temples of various sizes, of which remains more or less still exist; of 7, only the foundations, and an occasional fragment of a wall; but of 2, the sanctums exist yet intact, though the upper works have all gone: in front of the South-West of these two, are now set up 2 or 3 large quartz crystals, one, a cubit in length, as well as a number of oblong mottled rolled boulders, such as are used occasionally, to supply the place of the more highly finished Saivic emblem in small villages; there are also among them, the Votive horses and elephants of baked clay, which are generally offered by the poor, who cannot afford anything more valuable, as offerings to the power worshipped.

The mound on which these temples stood measures 200 × 100, it has a lower mound standing out of it at right angles, on which the traces of some brick buildings exist; a short distance off is another mound, about one hundred feet square, on which stood a large temple, the walls of which have obviously been dug out not very long ago; as the adjacent village possesses no brick remains, I infer the bricks were carted off to some distance.

The two temples which still stand, as mentioned above, in a partially dismantled state, must have been built during the Gupta period; though of no large size, the sanctum of the more perfect one being but 6⅓ feet square internally and fifteen feet square outside, they are of great interest, and would be of great importance, if excavations brought to light inscriptions; for not only do the doorways appear to have been of the form which is peculiar to the Gupta Temples, of an upper door sill longer than the lower, so that the lines of mouldings and sculpture have a small piece of return at each end; but the figures of Ganges and Jamna occurring on the lower portion of the main side-jambs, are additional proof of their great antiquity; but their great importance arises from the circumstance, that they inshrine, as objects of worship, sculpture which recals at once the sculpture at the great Adina Masjid; the central figure being inshrined as it were within, and canopied over, by the trefoil arch, with the ends finished off into Magars with raised snouts, and the bird legged Gandharva riding on them, just behind their conventional raised head and projecting eyes. The sculptures at Adina are perfect in all parts, except at the ends, where clearly the iconoclastic spirit of the Muhammadans, destroyed the human headed bird; this sculpture now enables to be restored with absolute certainty, what could hitherto be filled in only conjecturally, and were a dated inscription to be found among the ruins here, it would fix from the very strong similarity of the execution, no less than of the general lines of the exquisite sculpture here, to those in the Adina Masjid, the date of the temples which were demolished to build that superb Masjid. I may add that the material a close grained hard black basalt. capable of a high polish resembles precisely the material used in the Adina sculptures.

The figure worshipped in the Sanctum is that of Haragauri; on the pedestal are the Bull and the Lion flanked by Ganeça on the rat, and Kartikeya on the peacock. From the central figure on the architrave of the doorway, this temple was apparently dedicated to Parvati, while the adjacent one was dedicated to Siva, and now inshrines his symbol with its accompaniment the Argha still in situ, and undisturbed, though along with it, there is to be found inside, (and apparently brought from elsewhere) a misproportioned figure of Aditya.

The ruins of a temple facing this, inshrined a sculpture similar in its exquisite workmanship and forms of scroll work and trefoil arch, to the one described above; but in this case broken, and only the fragments exist; like the last it was of Haragauri.

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I consider the judicious use of a few trial trenches here in hope of discovering some object which would accurately, or at least within a limit of a few years, define the date of the temples, very desirable.

The ruins here are not in the Bengal list, and I would insert them in a future issue as object No. 115.

Objects Nos. 24 and 27 of the Bengal list have been noticed in Vol. VIII Arch. reports, but certainly No. 24, and probably No. 27, will need a second visit; with some trial trenches. Without something more than a look at the surface, it would be useless to visit them. A worn inscription used to be near Kherhi, and as it was an object of worship, it was difficult to touch it. It may have since been deposed from its position as a divinity, and consequently may admit of being copied.

Objects Nos. 21 and 22 have been noticed repeatedly. In the Journal As. Soc., in the Archæological reports Vol. VIII, in Buchanan, in the Indian antiquary, and in Hunter's Statistical Account of Bengal; it is only necessary to add here, that the statements made regarding the coil of the great serpent being artificially cut on the face of the hill are not borne out by facts: there is not a single chisel mark of any sort whatsoever, which could be tortured into a portion of the curve of the snake coil, but as I have said in Vol. VIII, the natural rock, which shews a tendency to separate, off the smooth curved surface, in flakes, as in the Barabar Hills, but especially in the Kawa Dol rocks, have so separated, leaving attached, fragments: and these attached fragments, with the aid of the imagination may be taken to represent a gigantic coil round the Hill.

Mandar is mentioned in the Mahabharata, not only in connection with the churning of the Ocean. In the Varaha Puruna it is particularised as a place of pilgrimage: a deep tank is mentioned at its foot to the South, as also one on the summit, as also the sapta-dhara and the pancha-dhara at its foot, there is mention also of a cave on its west side, which I could neither see nor hear of: it is also mentioned in Nepalese Buddhist literature, (Rajendra's Nepalese literature) in a manner, shewing, that in Asoka's time, it was the seat of learned Jainas, and incidentally, the passage bears out, in a remarkable manner, Ed. Thomas' supposition, that Asoka professed the Jaina religion, at least in the earlier part of his reign, after his conversion from Brahmanism. The passage runs. "He deputed Supindola Bharadvaja a Yati from the Mandar Hill to preach the true religion every where over his empire."

As Mandar is now and has long been a place of Jain resort and worship, this passage, with the mention of the preacher

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Supindola, as a Yati, establishes, not only the existence of a Jain College and shrine in Mandar in Asoka's time, but also shews, that Asoka's so called Buddhism, was really very like Jainism in the earlier part of his reign. What reason or legend accounts for the Jains establishing themselves in Mandar I have been unable to ascertain, the fact of the Jains having had places of worship in Mandar 250 B. C. (though no remains now exist of them) and having now also places of worship there as attested by the Temples on the Hill and several at the eastern foot, is beyond question :

That any Jain remains and Buddhist ones there, were destroyed by violence, or by the withdrawal of royal patronage in Aditya Sena's time, appears probable ; but I would, from the figure of Varaha and of Narasinha ; the one sculptured on the rock at the very summit, and the other in the cave, and judging from the unfinished outline of the colossal figure known as Madhusudhan, but which after careful scrutiny I feel assured was intended to be finished as Narasinha, ascribe the first discouragement of, if not suppression of the Jains, to Gupta Kings earlier than Aditya Sena Deva ; probably to Chandra Gupta II or Budha Gupta ; since whose time, down certainly to Aditya Sena, and probably down to the Muhammadan conquest, the place appears to have been a place of Hindu worship, with the Jains on sufferance only. The present Jain Temple, dates only to the British raj, while those at the foot of the Hill, can only date to the period of the last Nawabs of Bengal, when the toleration shewn by the Murshidabad Nawabs, and the British, and the great influence of Jain wealth in the Court of Murshidabad, and with the British, in the persons of the wealthy Setts of Murshidabad, enabled them to rebuilt in safety the old Temples, which less tolerant Hindu Kings had destroyed, and Muhammadan Governors prohibited from rebuilding.

That Aditya Sena dug a tank and cut the steps leading up the hill, appears to be established by his inscription on the rock. No. 105 of the Bengal list ; I am of opinion that the tank he refers to, is the upper one, close to the Narasinha cave, while the lower Papaharani *now* the most sacred one, except the Akas Ganga, is a later addition or rather has become the more important, at a later period, as a work of man, for its steps are built of fragments of older buildings ; as a natural pool, it is must have existed from an unknown antiquity.

I may add in conclusion, that the reading of the name in the Mandar Inscription, as Ugra Bhairava is incorrect ; no such name occurs in any Mandar Inscription whatever.

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Close to Mandar is Bausi, which contains a Temple, a Tank, and an interesting gateway, and is entered as object No. 20 but I have not seen the place.

Objects Nos. 12, 13 and 14 are at Kahalgaon. Kahalgaon which is noticed in much detail by Cunningham Vol. XV appears to me to be the place of Sacred Tirath mentioned in the Mahabharata, (the rock cut Temple, object No. 13 is mentioned by Hiouen Thsang.) And the form and sculpture of the rock cut Temple would place it in the earlier Gupta period, consequently the place where it stands must early have been a place of religious worship. It is still a place of worship, not only to the Muhammadans, who have a Darga (object 14) on the level platform higher up, on that same Island, but by the lower class Hindus, who make offerings to the twin divinities Haji and Hajman, who are supposed to reside on, or in, the larger and the smaller rock in the river, at that place.

As the Mahabharata distinctly mentions one Sacred Bathing place in Champa, and I am not aware of any other sacred place in the river, (for Jahngira the only other possible place has been shewn to have become so subsequent to the Mahabharata and even to Hiouen Thsang) I have no option but to identify this place, which was certainly a place of some sanctity at the time of the Guptas, has been so all along, and is so now, (as attested by the offerings made to Haji and Hajman and the Pir's Dargah,) with the Tirtha of Champa; and in that case I would identify the Gangal Dei Hill, with a temple on the top, a little to the East of Kahalgaon, (presently to be noticed) with the Dandaparna mentioned in the extracts from the Mahabharata.

These rocks have been noticed by numerous travellers: Hiouen Thsang praises Kahalgaon and winds up by saying "those who go there to see the place are reluctant to return."

Major Archer only just alludes to Kahalgaon, he mentions the "religious edifices" upon the rocks in the middle of the river.

A beautiful view of the rocks may be seen in Vol. II Emma Roberts' Hindostan, and a brief description, which bears out my statement that the rocks are considered holy to this day. Alluding to the size of the river here she says. "In the rainy season, the river runs roaring through these rocks with fearful turbulence, spreading its broad waters like an Ocean, the projecting points of Colgong and Patergotta forming an extensive and beautiful bay, surrounded by an amphitheatre of hills, from which it is difficult to fancy that a river has supplied the floods that reach from shore to shore."

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The artist Hodges also notices Kahalgaon and the rocks: of the country about Kahalgaon he says "The country about Colgong is I think the most beautiful I have seen in India. The waving appearance of the land, its fine turf and detached woods; backed by the extensive forests on the hills, brought to my mind many of the fine parks in England, and its over looking the Ganges which has more the appearance of an Ocean at this place than of a river, gives the prospect inexpressible grandeur."

Lieutenant Bacon however gives such a graphic account of Kahalgaon, its rock cut Temple and Cave and Darga and incidentally throws a new light on Hiouen Thsangs statement why "those who go there" "are reluctant to return," that I extract the paragraphs, premising, that I quite agree with him in his estimate of the beauties of the place in still life, as well as in moving life.—Vol. I p. 277 to 281.

"The scenery around Kahalgaon is beautifully picturesque and varied in its character: from the opposite banks of the river, the view is quiet and charming beyond what is usually met with on the Ganges; the grey hills of the Rajhmahal range form a tender back ground for the deep-toned umbrage about the conical shaped temples overlooking the water. In the centre of the sacred stream are three rocky islands, from which are springing on all sides luxuriant trees and vegetation, for the nourishment of which the scanty soil appears hardly sufficient.

In many places, the rocks are rudely sculptured with mythological devices, and one of the largest blocks upon the top of the westernmost island has been hewn into the form of a Hindu Temple; upon this also there is a deep cavern, into which I heedlessly advanced, but more speedily retreated, in consequence of my olfactory organs being thrown into a state of insurrection by the sickening offence of human putrefaction; for, a few paces within the entrance lay the carcase of a *Jogi*, or other religious devotee, in utter nudity and corruption. A solitary jackal was the only beast of the scavenger tribes to be seen; and this is difficult to be accounted for: the vulture and the kite possess organs of scent, or vision, so acute, as to detect the existence of any putrescent matter from an almost incredible distance; and I could observe several of these harpies wheeling round and round in the heavens, prosecuting their eternal search after filth: after I quitted the place I remarked that when they for a moment alighted upon the body, they again took wing, as if it were unfit even for their foul appetites.

Above this cavern is the tomb of some holy man, which I found beautifully swept and bedecked with flowers; and within the *Tahk*, or little niche at the head of the tomb, were a few copper coins and a number of couries, or small shells which pass current among the natives, the value of one of them being about equal to the fortieth part of an English farthing. Thousands of pigeons frequent these islands, and in despite of their being such "sweet little innocents," as the ladies called them, I took the liberty of shooting a dozen or so, for my servants and the boatmen.

It has been frequently remarked, that among the native women to be seen in Bengal Proper that is, in the lower provinces of Bengal, there are very few, indeed not one in a thousand, perhaps, who have any just pretension to beauty of countenance; in this opinion I most fully acquiesce, for I verily believe I never in a single instance beheld a handsome native woman in the vicinity of Calcutta. A symmetrical and graceful figure is occasionally to be seen even there, and a well turned ancle is not less common than in other parts of India.

I have been led to this subject by the contrast which the women of Kahalgang present to those further eastward: I saw several at the *ghats* who struck me as being remarkably beautiful, both in feature and figure, although their complexions were exceedingly dark: their forms were particularly slight, and bearing such an air of elegance and graceful ease, as could not fail to attract admiration: their faces too were of a more Grecian mould than I had hitherto seen among them; and in this the effect was considerably heightened by the simplicity of their costume, and the classical style in which the *Chuddur*, or large scarf, was thrown across their figures. There is one charm, and by no means a slight one, which is possessed by a large majority of the native women; I speak of their small feet, and particularly good ancles. and of their free and elastic step, which may well excite the every of any beholding Englishwoman, with her pinching satin shoe and delicate silk stocking. But who. among our starched and tight-laced, though naturally lovely women, would venture to place the charms of her cramped figure in competition with the unshackled graces exhibited among these children of nature? God makes the one, and the mantua-makes the other."

I particularly allude to the vast lake like expanse in which the river Ganges is at were lost here, because I conceive it was here and not at Jahngira, that the holy spot was, where Jahnumuni performed austerities; and this may also be the vast and holy lake into which the Ganges is said to flow in the Mahabharat;—but this is pure speculation.

About 5 miles down stream from Kahalgaon is Patharghatta, object No. 15 of the Bengal list, the place is noticed by various travellers but Bishop Heber is the only one who gives some description of the remains there. Vol. I pp. 264 to 268.

The first objects of interest at Patharghatta coming down stream, are two rock sculptures called Nakta Nakti, which are carved on a boulder that juts into the stream and are drowned when the river rises; there is a shrine of Mahadeo close by to which Boatmen, Hindus and Muhammadans alike, make offerings for safe passage up or down.

Near these sculptures on an upright rock are faint traces of carved panels but they are much worn.

The adjacent Temple of Mahadeo known as Budha Nath which with other remains I propose to number as 124 Bengal list is enveloped in the roots of an old Bar (Vata) tree; the temple is an old one of the premuhammadan period, its sanctum is 11 feet across each way, but only the west wall for a portion of its height is intact, the North and South walls are partly standing only, and have been repaired with rude boulders set in mud; there are numbers of sculptures collected in the cell, which originally inshrined an emblem of Mahadeo of which the top alone is now visible; among the sculptures are numerous fragments of the Gupta period, carved into the conventional rock cut caves; there is also a fragment of a small model of a Temple, shewing the moulding of the cornice over the straight part of the walls, and the shape of the pyramidal roof which covered it; the pyramid being a low flat one: The Temple was built of bricks set in mud and their surfaces carefully smoothed, the bricks measure 9½″ × 6″ × 2″: each face of the cella interior, appears to have possessed 3 inches roofed over by flat lancet shaped arches, 3 feet 8 niches across with 7½ inch pillars between, the arches being formed by corbelling out the layers of bricks and cutting them to shape; as the walls have fallen mostly, it is not possible to ascertain the size of the entrance doorway.

On the rocks at the rivers edge are sculptured (Object No. 15 Bengal list) Varaha, Surya, Vajra Varahi or some similar goddess. Ganeça, Mayadevi, and Hara Gauri; I infer consequently that the sculptures date to the early Gupta period; higher up is a figure of Buddha, known as Bhairon; it is a seated figure in the style of the Buddha Gaya ones, seated cross legged, while one hand hanging down points to the earth, as witness to his good deeds; it is called "Bhairon": among the fragments in the Temple, is a 4 faced Mahadeo with á tall peaked Jata; there is also a piece of sculpture representing a model temple adjacent; on the front vertical panel (below the conventional pyramidal stepped roof) is a figure of a woman holding a lotus and a jar and a sculptured

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tree or lotus stalk rising up from the base to the crown of the model; but as the top is broken off it is not possible to say whether it is meant for the stalk of a shady or sacred tree or of a lotus.

There are numerous small caves, some natural and some partly helped by art, in the side of the hill.

The principal objects of worship now, are however inshrined in 2 temples, built in the 19th century, and consist of figures of Parvati and Siva, no doubt more or less ancient; but though the temples are modern, the original throne or Sinhasan is ancient, as are also the bases of some large votive Stupas (in stone, sculptured) and several figures broken or partially broken. A very fine but unfortunately broken figure of the sun, outside, is also ancient; the 7 horses are well sculptured, and the figure itself deserves preservation and record by photography, for the excellence of the execution of the sculpture; it was inscribed in characters of the 9th century but only a few of the letters now remain, "Deva Sri * * * Pra Kirtti ta * * * tu devasva." The objects here might be numbered 125 in the Bengal list.

On the hill now stands a Bungalow, but no doubt once stood a temple; and on another part of the hill, are to be seen traces of the platform of a Masjid; but this Masjid and its platform are built of bricks differing from, and the Masjid is differently aligned and eccentrically placed in reference to another, and obviously older platform, which it overlies; so that there is clear evidence here, of the existence of at least one temple converted into a Masjid: it is said that a former owner Mr Macdonald, in cutting a roadway from Patharghat (the ghat below) to his house above (on the peak of the hill) came upon a buried copper vessel full of copper coin, which he sent to the Asiatic Society's Museum.

I do not particularly describe the caves of Patharghatta as Bishop Heber and others have already done that for me (they might be included in the Bengal list as No. 126), but I must not leave the subject without some passing notice of the very fine sculptures on the vertical face at the North-East side of the hill near its summit; one series consists of the Das Avatar of Vishnu, and another series consists of scenes from the lives of the various Avatars; these sculptures resemble very remarkably the sculptures of the earlier Guptas, in Besnagar and Udigiri, and I have no hesitation in ascribing them to the 3rd century A. D. Tradition says, that the Raja who caused these to be sculptured, lived East of Patharghat hill, and the site, of his fort, is pointed out on a piece of high ground, covered with fragments of brick and debris; he had a daughter who was an ascetic, and for her he built a Temple and residence on the little mound to the North-West of Patharghat, with a covered passage to the Ganges: remains of brick debris still exist to attest the existence of buildings of some kind on the hill and down the slope: close to it is the present Madhorampur factory, and to the South of the factory are tanks, two of which have each a small square island in the centre of the tank; all these are ascribed to the same Raja, the sites all need careful examination but without trial trenches any further examination by merely looking at the remains, will be useless: as the sculptures on the hill are undoubtedly early Gupta, I think the ruins well worthy of further examination by trial trenches, I would number these sculptures and the two mounds of ruins as Nos. 127, 128, 129 in a future issue of the Bengal list.

For further particulars of Kahalgaon and Patharghat. I refer to Bishop Heber, to Hunter and to Cunningham Vol. XV.

Between Kahalgaon and Patharghat, is a hill known as Gangaldei Hill, it is close to the ruins just described, and has a tree on the top, to which pilgrimages are made; I identify it with Taverniers Pel Gangel, which he notices below Bhagalpur. Near it is Kasdi hill crowned by a targe tree, a Hindu Temple and Mahadeo; these two objects I would add to the Bengal list as Nos. 130, 131.

Objects Nos. 16 and 17 are noticed by Bishop Heber, there are two Masjids and a Dargah; one of the Masjids has recently been repaired by some public spirited Muhammadans, the other one is decaying, and as there is nothing remarkable about, it, or about the Dargah, this slight notice of them is sufficient.

A small cave on the river face of Pir Painti, in the hard conglomerate, appears to have escaped the notice of all the travellers. There is also, on the highest point of an adjacent knoll, an old tomb of some European, which a couple of rupees would help in preserving.

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ARCHÆOLOGICAL SURVEY

OF

BENGAL

REPORT

1887.

BY

JOSEPH DAVIDITCH MELIK-BEGLAROFF,

ARCHÆOLOGICAL SURVEYOR, BENGAL.

PART II.

ARCHITECTURE AND ART.

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REPORT

OF THE

ARCHÆOLOGICAL SURVEYOR OF BENGAL,

FOR 1886-87.

PART II.

The village of Umga whare the Temple the subject of this report is situated is a small village about 2 miles to the south of the police outpost of Madanpur in the district of Gaya on the Grand Trunk Road, and about 5 miles from Deo the seat of the present Maharaja of Deo. It has been selected as the subject of this second part of the report for the reason that it was the building of which the drawings were fully ready, as it is obvious that without completed drawings the writing of the Architecural report is not possible.

The Temple at Umga is aligned with its entrance facing the East; through inadvertence, the exact angle at which the longitudinal axis of the temple is set out in regard to the meridian, was not observed, but roughly it appears to have been aligned fairly correctly.

As there are no surrounding buildings, nor any more ancient remains at the site of the Temple to have had any possible influence on the orientation, this omission becomes a matter of small consequence, as whatever the error, this error is purely one of setting out, and can explain no anomaly in the orientation, nor throw any light on any matter connected with the temple, except the degree of knowledge of the architect and the accuracy with which he did his work: for this last other data are available.

The material of which the temple is built, is a coarse-grained granite, obtained, so far as can be judged, from the hill itself on which the temple stands: the architect had evidently studied the subject of supply of material carefully, as most of his stone, appear from remains of marks of the quarrymens operations yet existing, to have been quarried, higher up the spur of the hill, on which the temple stands, thus facilating carriage of the material from the higher quarrying ground to

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the works; a few stones appear to have been quarried lower down however, but the quarries down below are not extensive. Although the ruins of several other temples stand on the hill higher up, of which two are undoubtedly more ancient, they were either standing in good order, at the time this one was built, or the architect or his employer, had conscientious scruples against utilising the material of the older Temples (if they were ruinous at the time) in erecting a new one.

The orthodox recognised procedure, of setting up a solitary pillar in front of the temple, as an earnest of the builders pious intention to build the Temple, was here followed; and the solitary stambha still stands in front of the entrance, on the rock, a few feet higher up. I suppose that a figure once occupied the summit of the solitary pillar; (as is the case elsewhere) the figure however has long ago gone, and as none exist in or near the temple; I suspect the Muhammadans threw it down and broke it.

Naturally with such a difficult material as a coarse-grained granite, delicacy of execution or minute elaboration in design or execution was not to be expected, and the architect wisely, and unavoidably confined himself to bold, if somewhat coarse, ornamental features; the mellowing hand of time, and of the whitey-grey lichen, which continues to fasten itself on granite, has softened the surfaces, and added a beauty, which assuredly the architect had not contemplated.

But although the execution is, and so far as can be judged now, was designedly coarse in the exterior; the interior was more carefully, though still somewhat coarsely finished; the surfaces are more even, but nevertheless sufficiently coarse to lead to the inference, even if yet adhering fragments did not attest the fact beyond the possibility of denial, that a fine coat of lime-smoothing covered the coarseness, and corrected the slight errors of execution in the forms, surfaces, and edges, of the mouldings and ornaments.

That a similar coat, perhaps a trifle thicker, of fine lime smoothing was employed in the exterior, I do not doubt, the numerous errors and irregularities, too great to have been permissible by any careful architect, yet sufficiently minute to be readily capable of correction by a fine coat of lime smoothing, compel me to suppose, that as in other temples in India so far as I have seen, so here, the architect relied on the perfectly well known, legitimate, and recognised custom, of a thin, covering coat of lime-smoothing, to remove the small defects unavoidable with such a material as granite, worked by ordinary Indian workmen.

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A prejudice exists I believe in the minds of European architects, against covering surfaces of cut stone with a coating of lime smoothing. I remember a time when it would have been a serious architectural or artistic heresy to have insinuated, that the Greek sculptures, over which connoisseurs went into extacies were ever colored; and yet I believe it is now established beyond the possibility of dispute, that the marble surface of Greek sculpture was colored, and colored rather gaudily; and it does not appear, that Indian Architects Hindu or Muhammadan ever entertained that (and as it appears to me, accustomed to Indian modes of thought, unreasonable) prejudice against the use of lime-smoothing and color interiorly, and of lime-smoothing, with or without color exteriorly, which many modern European Architects entertain: with the single exception of buildings of the Asoka period, (and a very few isolated examples of similar buildings of a very early age) whose religious edifices, as well as caves and edict pillars, had their surfaces not only cut and finely smoothed, but actually polished, I have reason to believe, so far as my experience in North India goes, that every other building and its sculpture, was covered with a very fine coat of colored lime smoothing, or other coloring material or of gilding: from the all but actually polished sculpture of the Grecobactrian age in the Panjab (as shewn in the Yusufzai sculptures) to the polished surface of the stone work in the Adina Masjid of Muhammadan Kings, there have been, in almost all buildings and sculpture, indisputable actually existing traces, and in all, the strongest presumptive evidence, of the use of gilding, or of color or of both. To understand Indian Art, it is necessary to divest ones self of western prejudices, and enter into the spirit of an art, which, employed by a different people, under radically different climatic conditions, and with widely different æsthetic ideas, could not, in the very nature of things, avoid differing in the coloring, as they did in the forms and arrangement of their surfaces, and even in their constructive expedients, from the practice in western countries.

This very radical difference, is perhaps best shewn in the fact, that the courses of stone, composing the temple, are laid on each other dry, without any cementing or other binding material of any kind whatever; the stones are, in the lower courses, bound together with iron cramps, but this is omitted at least so far as one may judge from external appearance only, somewhat higher up, where the stones are simply laid on each other, and rest there without any other resistance to a pushing force than the friction due to weight alone, between the cut surfaces. In the lower courses the heights of the courses in the interior and in the exterior surface being different, the pushing

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out of the courses could not take place without first turning over the stones of the course whose upper surfaces overlap as it were the lower surfaces of the course in process of being pushed out, but even this resistance to displacement does not exist at the small height from the ground where the surfaces of the courses, outer and inner, are on the same level.

With such a constructive disposition of material, it must be evident, that for stability, the courses should be subjected to only directly vertical forces; no lateral thrusts, or at most but a very small amount of lateral thrust, was alone admissible, and this appears to have been accomplished by the arrangement of the parts.

It will be seen from the section (Pl. I) that the interior arrangement of chambers under the tower, is, first a room 12 × 10 (in round numbers) and 13 feet high, roofed by beams and slabs, resting on corbels and architraves; over this lower chamber, is another similar chamber 12 × 10 about 14 feet high; roofed by the method of intersecting squares; that is, one set of slabs is placed diagonally on the bearing walls, so as to leave open a square space, diagonally placed in regard to the original opening, and of exactly half its area; this area is similarly dealt with by the next tier of slabs till at last the opening is sufficiently reduced to be slabbed across.

It is evident that if the chambers end here, there is absolutely no thrust whatever on the side walls of the tower, and the only question is, as regards the thickness and consequent strength of the stone slabbing, to bear the enormous weight of half the height of the tower: whatever the conjectural thickness of the uppermost slabbing, it is self evident that the 2 lower tiers of diagonal slabbing of the 2nd Chamber 14 inches thick each, are quite incompetent to support the tremendous weight, supposing the rest of the tower solid; a third Chamber similar to the lower two must consequently exist above the second one; and its entrance (now permanently closed) will I conjecture, be found at the great lotus boss which forms such a prominent feature in the facade (see plate I) at a height of 45 feet from the ground; and in all probability; a 4th Chamber, marked by the projecting lion in the facade. (See plates).

With these 4 great chambers occupying the main body of the tower, it is clear that the uppermost chamber may be roofed easily by stone beams of the necessary depth, breath and strength to bear the comparatively small weight of the pinnacle, especially if, as I conjecture, the pinnacle itself he hollow; I am of opinion that the uppermost chamber is roofed not by intersecting squares but by a system of corbelling which involves the consideration of forces differently distributed though still pressing really vertically without *appreciable* thrust; but where correct, or even approximate dimensions, are from the nature of the case, unobtainable, further discussion of the distribution of forces in the tower is useless.

In regard to the Mandapa, the Mahamandapa, the 3 Arddha Mandapa's, (the two side ones closed and formed into chambers below and windows above) and the Antarala, it is obvious that all the forces in operation are vertical, and the only questions are (1) the proportion of bearing surface to the weight, (2) the strength of the beams supporting the roof.

Omitting the tower, and the small portion of the weight of the flat roof of the Antarala borne by it; the total bearing area at the plinth, of the rest of the building, amounts in round numbers approximately to 720 square feet, and the total weight on it to 21,400 cubic feet of stone; assuming the weight of a cubic foot of this granite at 160 lbs. per cubic feet, the average weight per square foot borne by the courses at the plinth is found to be 42½ tons or only 32½ lbs. per square inch; while at the foundations, the pressure is rather less, owing to the greater bearing surface as compared with the increased weight.

The maximum intensity of pressure, will be at the foot of the shafts of the pillars; and of these, at the foot of the 2 front pillars of the Mahamandapa. Each of these, bear the weight of a square of roofing, besides their own weight, and that of the architraves, amounting in the aggregate approximately to 600 cubic feet of stone and of terrace roofing; assuming the average weight of the mass to be 150 lbs. per cubic feet, the bearing surface of the pillars at their base being 1,050 square inches, the pressure is seen to be only 86 lbs. per square inch nearly, a proportion, which, even for the weakest sorts of granite, is an intensity only one-seventieth of the limiting or crushing pressure which it can bear, and which, for the material actually used, probably only one-hundredth of what the material can ultimately bear.

Of course, the walls of the sanctum carrying the tower, are bearing a greater pressure, but even if solid, the pressure would not be greater than one-twentyfifth of what the material would easily bear.

The total bearing surface, or area of points of support, in the Temple is approximately 1,220 superficial feet, while the total area covered is 2,400 superficial feet, giving an approximate proportion of half the total area covered, as devoted to the surface of support, but this proportion is less in the Temple, exclusive of the tower, whose support monopolises no less than fivetwelfths of the total area of support, while the surface covered is but three-and-a-half-twelfths of the total area covered: excluding the tower proper, the surface of support bears to the area covered, the approximate proportion of one to two-and-a-half, that is to say, of the total area covered 40 per cent. is devoted to the points of support.

The most massive buildings in Europe do not approach this proportion in massiveness, yet so cleverly has the design been made, that though undoubtedly massive, one fails to realise that it is really four times as massive as the most massive buildings in Europe, and the general impression left by the temple as a whole, is rather that of an elegant though somewhat heavy grace, than of the intolerable massiveness which the figures disclose on calculation.

It is evident, that so far as the internal forces of the building are concerned, it is perfectly safe and might last for an indefinitely long period; there are however external forces; of these the only ones which appear likely to be injurious are the growth of vegetation, and wanton or wilful destruction by human agency.

Both these forces have been at work on the Temple; some stone blocks near the base of the Temple are displaced, and were, I am told, so displaced, by some villagers many years ago, for the sake of extracting the iron cramps; and as the iron cramps have been wrenched and cut out, the story of this wanton vandalism appears well founded; at present, however, and for many years the Rajas of Deo have taken an interest in the Temple, and the process of wanton destruction is not likely to be repeated.

Vegetation has at some remote period been active in disrupting the stones in several parts, notably in the front facade near the top, while almost the whole of the upper line of the double cornice over the Mandapas, has also at some time fallen down, in all probably forced out by trees growing on the terraced roof, which composed, as it is, of partially burnt brick and lime, would afford a secure and ample nourishment to any plants, that could once succeed in forcing their roots into it. At present and for some time past the Rajas of Deo have kept the Temple free from vegetation.

The only places where a mortar composed of partly burnt broken brick and lime has been used, are, in the terrace roofing of the Mandapas, the upper surface of the shoulder of the Temple from where the neck of the pinnacle springs, and the upper surface of the great corrugated wheel on the top; each of these terracings as they now exist is the result of subsequent

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repair, and I believe that the original old surface which must have become partially broken up by vegetation, was simply overlaid by a fresh layer of the concrete mortar now visible. The roof surface, as it exists now, slopes down from the centre, where it, along with the bearing slabs, forms a mass of the enormous thickness of 4 feet 4 inches to a thickness of only 2 feet 8 inches at the edges over the cornice; the fall being no less than one foot 8 inches. It appears to me impossible that the original design could have contemplated loading the bearing slabs and architraves with such an enormous thickness of material, and my impression is, that the original surface was fully 2 feet lower, this would bring the surface at the centre of the roof to a point a little higher than the top of the lower one of the double cornice marked C, (Vide plates) and with a gentle slope, would bring the edge, to a level a little below the upper surface, and a little above the lower surface, of the stone block, which has been cut to form the mouldings of the cornice; I am led to infer this from the spouts, of which two are now lying about, which are formed of stone blocks of just the thickness of the cornice blocks, with a channel formed by cutting through about half the thickness: these spouts would, in the original building, have projected at the level of the lower cornice, beyond the face of the cornice, and cleared the edge of the eaves; a position which spouts in other similar buildings, generally occupy; and the upper cornice would then form a sort of low parapet round the roof.

That the repairers, whoever they were, laid on a coat two feet thick during one repair, appears, however, exceedingly improbable. As the Muhammadans had certainly appropriated the temple at one period, as shewn by the Arabic inscriptions and the Kalimeh sculptured on the architraves and elsewhere in the interior, I infer that they repaired it once; there may or may not have been a second repair between the first repair and the recent (I mean within the memory of comparatively young living men) repair by the Deo Maharaja, but I think it certain that the Temple underwent certainly two, possibly three repairs.

The lime employed has been the ordinary kankar lime, obtained by burning the common nodular deposit of impure carbonate, found in the vicinity, with little trouble and cost. The proportions used in the composition of the original terracing are of course unobtainable, that of the last, appears to be rather more than one of lime to two of surkhi with a hard coat of pure lime smoothed over the surface.

The masonry work appears to have been fairly well executed, the stones are cut correctly to shape, and fit each other fairly

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well, in the face work outside; and most of the joints in the interior appear to fit accurately; but the joints are not always correctly squared, and a good deal of the fitting must have been done by actually chiselling the surfaces to fit each other on the spot; the horizontal lines of joints in the interior are not straight or even; the lines of joints do not run through or round, but are irregular; this is rather an advantage constructively, as wholesale sliding of the stones at the joints, is thereby rendered impossible, but with the surface unplastered, it does not produce an agreeable effect: exteriorly there is very much greater regularity in the joints, though even here occasional stray irregular joints obtrude themselves.

But though the blocks forming the exterior and interior vertical surface are on the whole fairly well fitted, this is not so in regard to the fitting together of the stones of the floor, which is executed in a very slovenly manner; as the foundation is solid rock none of the very disagreeably prominent unevennesses and irregularities of level can he ascribed to unequal sinkage, but must be ascribed to careless and slovenly work: nor are the joints of the roof slabs fine or even; possibly the floor had a layer of terracing on it which originally covered it and hid the irregularities; but if so this has long ago disappeared. The drainage too of the interior is very defective, indeed the side chambers below the two windows are without any outlets for water, and any that finds its way in by leekage between the joints of the stone floor of the window projections, must soak into the ground. The Mahamandapa too has its floor lower than that of either the sanctum or of the entrance, and any water which found its way there, must have soaked in or at best remained till it evaporated.

Exteriorly, being built on the ridge, the drainage is perfect.

The mouldings that adorn the Temple occur mainly in the tower, the rest of the Temple being exteriorly devoid of mouldings, except just at the plinth, just below the window, and the crowning double cornice. There are, however, at the doorways and at the windows, where pillars and pilasters occur, further mouldings, which properly pertain to the pillar, its base, capital, corbels, architraves, and eaves. The interior is also devoid of mouldings, except some lines round the doorways, on the throne, at the doorstep, and in and belonging to the pillars.

Of the mouldings on the tower, the diminution from the plinth to the superstructure, at the line A. B. (see plates) is effected by a moulding, which does not occur in classical architecture and but very rarely in gothic; its dimensions, and form, which is a sort of the inverted quarter round of classical architecture, is given in the drawings; (see plates) above this, a series of bold mouldings, carries the building gracefully up to the commencement of what may for the present be called the Sikhra proper. This space amounts to 252 inches, and is divided and sub-divided into smaller portions, by three for a divisor; thus the lowest vertical surface with its surmounting inverted "Cymarecta," is just one-ninth or 28 inches; of which the Cymarecta or curve is again just about one-ninth or three inches; the next moulding, consists of a broad flat surface, set back from the surface of the lower member by $\frac{1}{7}$th of of its height, and chiselled on top into the inverted quarter round (with a radius of 6 inches, or $\frac{2}{9}$ths of its aggregate height,) and a low recessed band or groove; this member also aggregates 28 inches or $\frac{1}{9}$th of the total height; above this come a torus, and a band, surmounted by an inverted cavetto, separated from each other, and from the lower member, by deeply recessed groovings or bands; these two mouldings jointly aggregate also $\frac{1}{9}$th of the total height, or 28 inches.

Each successive main projection or facet of the facade, being reduced on each side, as well as set back, in passing up from the lowest ninth to the second ninth division of the aggregate height, leave naturally 4 gaps marked G, (see plates), and by a happy inspiration, these very gaps, which would become a serious embarrassment elsewhere, are taken advantage of, and by deeply, indeed very deeply sinking inwards this surface, and carrying it up right to the very summit of the tower proper through every moulding, conforming in its surface to each successive moulding, but in each case having its profile deeply set back from the adjacent surfaces of the projecting facets, it is converted from a source of embarrassment, into what must be regarded as the most distinctive, and indeed characteristic feature of Indian Temple Architecture.

I invite the special attention of architects to this, which is perhaps the one subordinate feature, on which, more than on any other *single* feature, the peculiarity of Indian Temple Architecture depends.

These three divisions of $\frac{1}{9}$th each, carry the lower mouldings up to the base of the pilaster like member (see plate) to which the facets are now reduced by a setting back of its surface *all round* about 9 inches, or $\frac{1}{27}$th of the aggregate, and $\frac{1}{3}$rd of the height of each of the three lower divisions; the height of these pilasters is about 84 inches or just $\frac{3}{9}$th or $\frac{1}{3}$rd of the total height of 252 inches: the pilasters are crowned, by what must be taken to occupy the place of the capital and the sur-capital usual in Indian pillars; the capital or lowest member, of the features which surmount the pilaster is a plain block with a deep groove running horizontally across its middle; it is nearly 28 inches in height, or $\frac{1}{3}$rd of the total aggregate height of the upper members, which is 84 inches, or just $\frac{1}{9}$th of the

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total height; this is surmounted by a projecting band or vertical surface, with an inverted cymarecta, about 9 inches or $\frac{1}{9}$th of the aggregate height of the upper members, or $\frac{1}{27}$th of the total height; this with an intervening deep horizontal groove, is again surmounted by an exactly similar and equal moulding; these two mouldings run right round the building including the Mandapas; these are again surmounted by a torus, and with an intervening horizontal groove, by a projecting band and inverted cymarecta, and finally a cymarecta carries the mouldings up to the bottom of the Sikhra proper; these aggregate $\frac{5}{9}$th of the aggregate height of the upper members, making the aggregate of all the upper mouldings, one-third of the total height of the facade, from the plinth to the bottom of the Sikhra.

The law then, summarising the results arrived at, appears to be, to divide the height from the plinth to the bottom of the tower proper or Sikhra into there parts, of which one (subdivided again into 3 divisions) goes to the mouldings of the base; one to the shaft of what I have called and is virtually a pilaster; and one consitutes the capital, subdivided again into $\frac{1}{3}$d for the lower member of the capital, and $\frac{2}{3}$rd for the mouldings which together constitute the sur-capital, and which project from the pilaster to the same extent as the base mouldings, or just $\frac{1}{27}$th of the total height.

The most projecting facet of the tower basement, does not however go up beyond the pair of cornices which go right round the building; it apparently served the purpose of providing a suitably prominent place for the inshrining of a statue; but as the temple was at some period appropriated by the Muhammadans, no statue now exists in any of the niches.

But the influence of a definite regular law is not confined to the tower; the dwarf pillars of the windows, are just 84 inches high or $\frac{1}{3}$rd of the total height from the plinth to the bottom of the Sikhra, while the diameter of their shafts and upper square member (forming an integral part of the shaft) being 14 inches very nearly, is $\frac{1}{6}$th of its height and also $\frac{1}{18}$th of the total height.

The height of the tall plain square pilasters in front, from the base to the corbels above, which once no doubt supported the eave, is 14 feet 8 inches or 176 inches which is exactly half the total height of the lower square portion of the tower 252 inches.

The thickness of the corbel 14 inches is exactly $\frac{1}{18}$th of the total height.

But we have not done with the definite and simple proportions which regulate the parts of the temple exteriorly.

Taking 12·25 inches as a modulus, the breadth of the projecting facets of the tower are, at the plinth, 6 modules for the

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centre one, and 1 module, $3\frac{1}{2}$ modules, $4\frac{1}{2}$ modules respectively, working towards the corners from the centre; while the projections of each part beyond its adjacent one, is exactly one module.

But the central facet serves only as a sort of a pedestal for a niche and stops short at a height of 21 feet 8 inches from the zero of my measurements, *viz.*, the lowest floor level inside; the real facet which runs through to the top of the tower, is therefore this central sub-facet, together with its two adjacent small facets that is $6+1+1$ modules or 8 modules in width; which is exactly $\frac{1}{3}$rd of the total width of the side of the tower, and equal to the sum of the remaining two subordinate facets, *viz.*, the corner one and the intermediate one on each side.

The height of the square portion of the tower from zero of measurements is 24 feet 5 inches or just 24 modules, which is exactly equal to the total breadth of the tower at plinth.

The total height of the entire temple to the top of the pinnacle, is 74 feet, or 72 modules, or exactly 3 times the breadth of the tower at plinth, and also 3 times the height of the lower square portion of the tower, from zero of measurement to the bottom of the Sikhra as just shewn.

The height from zero to the base of the neck of the pinnacle is 62 feet 8 inches which is very nearly 3 times the 252 inches alluded to above.

The height from zero to the top of the curve of the tower (exclusive of the coping) is 61 feet 4 inches, or 60 modules, or $\frac{5}{6}$th of the total height, which is 72 modules.

The height of the curved part of the tower alone, is exactly 37 feet, or 36 modules, which again is exactly half the total height of the temple to its pinnacle, and one and a half times the breadth 24 modules, of the square part of the tower.

These are the obvious proportions, but there are others.

The diminution of the tower at the top is just exactly half, that is the tower is only 12 modules wide at the coping of the shoulder while it is 24 modules wide at the plinth, but the diminution is not uniform, for, as the central facet diminishes at the top till it is only about 16 inches wide or $1\frac{1}{3}$ modules, the side ones must necessarily diminish less than half, the rule is very elegant and simple. The total width of the tower is divided into 3 parts, of which one goes to the central facet, and the other two, one on each side, represent the sum of the corner and intermediate facets; these are in width at top $\frac{2}{3}$rd of the width at the bottom; calling the total width of tower base b, the formula is, top width $= \frac{1}{2}b = \frac{2}{3}$ of $\frac{1}{3}b + \frac{2}{3}$ of $\frac{1}{3}b + \frac{1}{18}b = \frac{2}{9}b + \frac{1}{18}b + \frac{2}{9}b$: where the width of the central facet at top is $\frac{1}{18}$th its width at

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plinth, and the corner and intermediate facets are $\frac{2}{3}$rd of the width of what they are at plinth.

It must be understood, that, to avoid complication, I have taken the facets as intact; actually the facets are separated by the deep narrow grooving G mentioned before, and the widths of facets and of grooving, all diminish regularly to $\frac{2}{3}$rd.

The exterior curve of the corner facets of the tower, is obtained by describing an arc, with radius equal to total height of temple, from a centre, at a height of $\frac{1}{2}$ the height of the tower (measured from zero of measurement to the neck of pinnacle) (*i.e.*) in this case, the centre falls in the horizontal line at the top of the 2nd corner Amalaka at 31 feet 6 inches above zero and the radius is 74 feet 0 inches. But there is a particular reason why the curve should begin at this height which is 28 feet 2 inches above the plinth, for it will be seen, that including the facets, the extreme width across, from the outmost facet North or East to the outmost facet South or West above the cut off of the niche facet, (which does not go up all the way) is just exactly 28 feet 2 inches. So that by beginning the curve at this line, there is left a cubical block below, as a support to it; an arrangement which is satisfactory to the eye; for as is well known the eye finds satisfaction in combinations however varied, of regular figures.

It will be found that the perpendicular distance of the curve at the shoulder, from a vertical tangent drawn from its starting point (*i.e.* at 31 feet 6 inches) is as nearly as possible one-fourth the total breadth of the base, or $\frac{1}{12}$th h. where h the total height $= 3$ b. b being the width of tower at plinth.

The space therefore, between the two opposite curves, drawn with the above radius, and corresponding centres will be $b - \frac{2}{12}h = \frac{1}{3}h - \frac{1}{6}h = \frac{1}{6}h = \frac{1}{2}b$.

That this is the correct line of the centre of the curve is shewn by a very close agreement of the curve so drawn, with the curve of the facet as carefully noted down by the method of ordinates from the actual building; and the architect has himself marked it, by placing a figure of Ganeça, in the front facade of the tower. The Ganeça it will be seen, is seated on a pedestal, of which the upper surface is exactly 31 feet 6 inches above zero.

It is now necessary to draw a curve, which, retaining the same curvature, will at the shoulder, leave a space which will measure horizontally $\frac{2}{3}$rd of the width of the corner facet.

The radius must obviously be the same, to retain the same curvature, but the centre will need to be shifted, both upward

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and sideways. It will be found, that such a curve, will need its centre to be 36 feet 10 inches above zero of measurement, and of course to be shifted sideways the width of the facet; similarly it will be found that the curve, which will leave between the curve just described, and itself, a horizontal space equal to $\frac{2}{3}$rd of the width of the intermediate or next facet, will have to be struck from a centre 40 feet 0 inches above zero.

It will be seen that the heights of the 3 centres (and the corresponding three opposite centres) are at the heights 31 feet 6 inches, 36 feet 10 inches and 40 feet 0 inches above zero; that is at $\frac{8}{16}$th, $\frac{9}{16}$th, and $\frac{10}{16}$th, of the height of the tower, (exclusive of pinnacle) that is of the 63 feet from zero of measurement. What a simple and beautiful Law!

But I will not be content with merely shewing the agreement of the curve on paper, which from its small scale and possible errors is liable to objection; the heights are capable of strict methematical calculation and demonstration.

Drawing a curve with radius$=$h, the ordinate of the point, of which the abscissa is $\frac{1}{12}h$, the first or outermost reduction will be, $\sqrt{h^2-(\frac{11}{12}h)^2}=\sqrt{\frac{23}{144}h^2}=\cdot4h=29$ feet 8 inches nearly, where $h=74$ feet as in this case: that is to say the end of the curve which will give the needful reduction will be 61 feet 2 inches above zero, as the curve starts from 31 feet 6 inches above 0 and the ordinate is 29 feet 8 inches. The *actual* height of the end of the curve of the tower which is the bottom of the coping at the shoulder is 61 feet 4 inches.

The 2nd reduction or the reduction which the 2nd curve must effect is $4\frac{1}{3}$ feet (*i.e.*) $\frac{1}{4}b+\frac{2}{3}\times\frac{3}{16}b-\frac{3}{16}b=\frac{3}{16}b$ or $\frac{1}{16}h$ very nearly, and the ordinate which will give this abscissa with the radius h, will be $\sqrt{h^2-(\frac{5}{16}h)^2}=\sqrt{\frac{31}{256}h^2}=3\cdot4h=25$ feet 2 inches where h is 74.

But the 25 feet 2 inches has to be measured downwards from the coping, as the height of the coping, fixed by the requirements of the first curve, is not alterable now.

Consequently the centre of this curve will be 25 feet 2 inches below the coping or 36 feet 2 inches above zero of measurement.

The *actual* point marked by the architect is the shoulder of the miniature temple on the front facade, corresponding to the top of the 3rd Amalaka, at a height of 36 feet 10 inches above zero.

The third reduction will be $\frac{1}{4}b+\frac{2}{9}b-\frac{1}{3}b=\frac{5}{36}b=\frac{5}{108}h$. and the ordinate corresponding to this abscissa will be $\sqrt{h^2-(\frac{103}{108}h)^2}=\cdot3h=22\cdot2$ feet.

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This ordinate must, for the same reason as the last, be measured downwards from the coping; which gives the height of the centre of the 3rd curve at 39 feet 2 inches above zero of measurement; the *actual* centre is at 40 feet and is marked by the Lions' head on the front facade.

It is now seen that the theoretically exact centres differ but little from the actual ones as marked by the architect, and the reason for this difference is not far to seek: the theoretical mumbers are arrived at by an elaborate calculation, while the actual points marked, are, at the simply proportioned heights above zero of $\frac{8}{16}$, $\frac{9}{16}$ and $\frac{10}{16}$ of the height of tower.

Remembering that the radius is 74 feet, the displacement of the centre by 10 inches, the maximum variation between theory and practice, will alter the positions of the points on the curve by scarcely an inch, within the limits, within which alone, the curve is actually used.

Is it possible, in face of this beautiful simplification, for practical application, of a complicated calculation, to say that Hindu Architects built by rule of thumb?

I have however not done with the proportions of the exterior of the temple yet. The diameter of the neck of the pinnacle is 8 modules (*i.e.*) $\frac{1}{3}$ the breadth and $\frac{1}{9}$h: while that of the great corrugated wheel above is 12 modules$=\frac{1}{2}$b$=\frac{1}{6}$h.

The extreme length of the Temple from the line of pilasters in front, to the primary corners of the Temple tower, is just 64 modules or $\frac{8}{9}$th of the height, and the width across, from the North wall of the North window, to the South wall of the South window, exteriorly, is 52 modules or $\frac{3}{4}$h nearly the width of the projecting portion of the Mandapa on the East, is 33 modules or $\frac{11}{24}$h; and its projection in front nearly 14½ modules$=\frac{1}{5}$h. The projection of the two windows North and South is each 9 modules nearly or $\frac{1}{8}$h: and the length East and West of the projecting windows is each 14½ modules or $\frac{1}{5}$h.

There must be other simple porportions in the composition of the exterior of the temple. One of these is the law which rules the apparently capricious variation of the heights of the corner Amalakas, but I have been unable as yet to reduce them to one series, and though they are reducible to three series, the result does not commend itself to me, and I prefer to think I have not hit on the law which regulates their distribution.

Interiorly the parts are also arranged in definite simple proportion, the sanctum is curiously enough, not quite square here but measures 12 modules E. W. × 10½m N. and S., the length is just half the outer dimension of the tower, the proportions

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reduced to terms of the breadth of the tower b being $\frac{8}{16}b \times \frac{7}{16}b$ while the passage leading to it, is 6 modules × 6 modules very nearly.

The width of the Antarala, that is the narrow space between the square of the Mahamandapa and the doorway of the sanctum is 5m wide.

The Mahamandapa also is not square, being 27 modules E. W. × 24 modules N. S. or $\frac{3}{8}h \times \frac{3}{9}h$.

The width of the passage from the Arddhamandapa or portico to the Mahamandapa is 6 modules $= \frac{1}{4}b = \frac{1}{12}h$.

The height of the sanctum is equal to its length very nearly; the height of the Mahamandapa is $\frac{3}{4}$th of the width.

The 4 central pillars are, including their bases and capitals, as in the dwarf pillars of the window, but excluding the corbelled sur-capital, 6 diameters high, which is the proportion in the dwarf pillars; but the more slender *dentated* pillars, are, including their capitals and bases, but excluding the corbelled sur-capital, 10½ diameters high; while their shafts alone, are 7 diameters high.

I have assumed 12¼ inches as a modulus, because every important feature of the temple is a multiple of it; I am quite aware that so far as we know now, the cubit is the unit of measurement in India, and as most of the main measurements are multiples also of the cubit, of 1½ modules or 18⅜ inches, it may be that was the unit of measure employed. For instance, expressed in these cubits, the principal measurements would be—

Interior	Mahamandapa	length	... 18	cub.
		breadth	... 16	„
		height	... 12	„
	Sanctum	length	... 8	„
		breadth	... 7	„
		height	... 8	„
	Passage	length	... 4	„
		height	... 7	„
	Dentated pillars width (very nearly)		... 1	„
Exterior	Width of tower		... 16	„
	„ central facet		... 8	„
	„ corner facets		... 3	„
	Width of great wheel		... 8	„
	Height of temple		... 48	„
	„ to top of curve of tower		... 40	„
	„ of square part of tower		... 16	„
	„ curved part alone		... 24	„
	„ of Mandapa		... 14	„

But a great many minor measurements, and some few larger ones, are not exact multiples of the cubit; so it has been considered better to retain for use $12\frac{1}{4}$ inches as a modulus.

It is needless to detail the forms of the pillars, their capitals, their bases, and their corbelled capitals, and architraves, as the drawings give the details with sufficient accuracy and minuteness; nor to give any further details of mouldings, outside or inside, all which are already better given in the drawings: of the eaves, the only specimen existing, has a projection beyond the face of the building equal to $\frac{1}{24}$th of the height at which it is placed; but whether the projection of the eave, is proportioned to its height relating to the ground line, or plinth line, or to the pillar over which the only example occurs, it is difficult to judge from a single example: in the latter case the projection beyond the corbel is $\frac{1}{12}$th of the height it is placed at, relatively to the bottom of the pillar, and $\frac{1}{9}$th of the height very nearly beyond the face of the pillar itself. In other examples elsewhere I have found it to be $\frac{1}{9}$th also, relatively sometimes to the pillar, and sometimes to the total height of its position above the plinth.

The only Amalaka proper is the great corrugated wheel on top, which has 26 corrugations, but I have here called the various divisions into which the 4 corner facets are broken up by mouldings Amalakas also, because these divisions, which are here plain plane-surfaced-square blocks, are, in examples elsewhere, and that frequently, rounded and corrugated. It is difficult to know what name to give to the various parts of an architecture, which has found no proper exponent yet in the English language, while its native name has been long lost: my native masons however during the repair of the Temple at Buddha gaya called them Charkhi—Charkhi would therefore seem to be the proper word for it, notwithstanding that its literal meaning is simply wheel.

The sculpture which must once have adorned the temple, was certainly broken up and destroyed by the Mussulman occupants, when they appropriated the temple; but some have since been brought, probably from elsewhere; it is needless therefore to say anything regarding them.

The only sculptures not broken up, and yet in Situ, are the lotus, the projecting Lion the sculptured Lions head, and the Ganeça on the facade, besides 2 subordinate sculptures and a fine figure of Ganeça high up with the lotus for his pedestal as it were, not yet noticed; except this last, every one of them are rudely executed, and the great projecting lion, has more the appearance of a mangy dog than of a lion. Evidently the Sculptors were very inferior workmen, while the refractory nature of the material must have greatly increased their difficulties.

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It now remains to trace if possible the basis of composition of the design.

It will be seen on reference to fig I (pl. 4) that in plan, the design is covered by half a circle (or square) for the Portico, a circle (or square) for each of the two windows, a circle (or square) for the Antarala or vestibule to the sanctum, a circle (or square) for the sanctum, half a circle (or square) for each of the three outer faces of the tower, and four circles for the 4 corners of the Mahamandapa; all of the same size; and one circle of 4 times the size, or twice the diameter, for the Mahamandapa.

The side elevation (see fig 2 pl. 4) consists of two equal circles, (or squares) and a cube surmounted by a half Sistrum, or Vesica-pisces; and the front (or back elevation) of two circles, differently arranged, with a cube between, surmounded by the half Sistrum see (plate 4) fig 3.

These arrangements, of regular grouping, of regular figures, cannot fail to produce an impression of symmetry and regularity which by a law of our very nature, satisfies the eye, producing a feeling of pleasure and an impression of beauty.

But there is a further basis; it will be seen, (see fig 1 pl. 4) that in plan the temple is fairly inclosed in the mystical Sistrum, (a figure well known to Western Architects and frequently used by them, as the Vesica-pisces) described from centres, which are at the centres of the outer sides of the two windows; one apex of the Sistrum marking the outer limit of the back of the sanctum. In elevation, too it will be seen, that the Vesica-pisces described with radius equal to the height of the tower, from a centre on the line of the commencement of the curve of the tower, fairly represents the basis of design of the tower; the apex of the Sistrum marking the pinnacle, and its centre appropriately marked by the lower figure of Ganeça.

But there is a deeper basis than this obvious one.

If a Sistrum be described on the plan, (see fig. 1 plate 4) with the centres of the opposite curves on the central line of the Mahamandapa and a radius equal to 6 times the distance between the centres of the Mahamandapa and of the Griha-garbha, it will be found, that the centre of the sanctum, is at the point, which marks one-third of the Sistrum, while the forward apex, falls about the position of the votive pillar in front, and the backward apex falls near a rock sculptured saivic emblem behind the Temple. The full length of the Sistrum being also 6 times the length of the distance of the centre of the sanctum from the centre of the Sistrum or equal to the radius, which is in theory, the perfect *yantra*.

In short the emblem of the divinity, would in this case occupy in the centre of the Grihagarbha just the symbolically correct positon, in this profoundly mystical Sistrum, the *yoni yantra* of the tantric symbology, which it ought to occupy.

Now referring to fig 2, with the same radius, and the centre line on the line where the Sikhra proper begins, describe an *exactly* similar Sistrum, and the very remarkable fact will become evident, that the centre of the floor of the sanctum occupies the same symbolically correct position, on this Sistrum, which the centre of the sanctum in the plan occupies in its corresponding yantra; that is, dividing the whole length of the vertical yantra into 3 parts, the centre of the floor of the Grihagarbha marks one of the points of division, while the upper figure of Ganeça for the location of which, on the facade, at the spot it occupies, there is no obvious reason, is seen to mark the other division of the perfect yoni yantra.

As the distance of the centre of the Mahamandapa is 31 feet very nearly from the centre of the sanctum, and as the floor of the sanctum is 6 inches above zero, the point at which the curve of the tower begins which is actually 31 feet 6 inches above zero is exactly 31 feet above the floor of the sanctum, and is not only equal to the distance between the centres of the Girhagarbha and the Mahamandapa, but further represents ⅙th of the radius, with which the curves of the yantra have been described.

I refrain here from enlarging on the deep symbolism which underlies the arrangement and combination, the symbolic and secret basis which underlies the design; partly because grossness of the ideas which it symbolises in a material, carnal point of view, needs no exposition; but mainly because, my knowledge of the more profound tantric Symbolism, is not sufficiently extensive to enable me at this stage, to launch into a disquisition on a subject which needs careful and delicate handling.

This being the first time in which Indian Architectural Archœology has had applied to it, research of the kind followed in the preceding pages, comparison with other buildings on these lines is impossible; until more buildings have been subjected to examination, with a special view to the evolution of the laws of construction proportion and composition, to compare or creticise would be folly. This report therefore refrains from comparing with each other, or criticising the works of Architects, who worked on bases, and with laws, which for the first time to my knowledge, it has been attempted in this report, to reach, and then only as regards the individual temple dealt with herein; but which, have previously, not been even looked for, in any single instance, in any work yet published.

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It will possibly be objected by some cautions thinkers, nurtured in a contempt of the Architects of India (because those alone whom *they* see, are unworthy), that what I have called laws and principles of construction and of proportion, and the esoteric basis of the composition of the temple, are merely coincidences. I would point out to them, that if Indian Architects deserving of any treatment, except a benevolent contempt, have ceased to exist, it is because their services are not in demand; the ancient ruling families are every where declining or declined into poverty; brahmans versed in esoteric tantric doctrines, are looked upon with feelings more approaching horror than respect, by the new generation, trained in schools of western materialism, and enthralled in a longing admiration for the practical material sciences, which have they see, transferred power and wealth, from their country, and themselves, to a foreign nation; and it is no wonder, that under such discouragement, knowledge of the arts subserving a decaying cult, should die out. Temples are still built it is true, but mostly by rich money lenders or successful traders, (universally disliked by the learned and the high born) who know little, and care less, for any esoteric or exoteric doctrines except the doctrines of plutolatry.

But it is not yet known that they do not exist, possibly they do, only they shun us as the embodiment of the system, which has destroyed their livelihood and influence.

Whether however architects who understand the esoteric principles of Indian Architecture, exist or not, the coincidences shewn are too numerous, to be the result of accident. Every feature is seen to be dependent on the main ones of breadth, or length, or height of the Temple; and even such minor and apparently trivial matters, as the location of sculptures at points, which, so far as can be seen on the face of it, appear to bear no special relation to any feature, are seen to have been so placed not at random, but in obedience to well known esoteric principles: such an overwhelming array of coincidences, all satisfactorily accountable by simple laws, cannot possibly be the result of accidental combination.

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ARCHÆOLOGICAL SURVEY OF BENGAL.

PART II.

1888.

ARCHITECTURE AND ART.

PRELIMINARY.

In submitting this section of Part II (that is the technical part) of my report to the Government, I beg respectfully to submit a few observations which appear to me called for in regard to the drawings which accompany, in explanation of the work of the season, and generally on such incidental points as cannot be embodied in the technical portion, but naturally would be expected in a preliminary introduction to the report.

The building which is the subject of this report, the Adina Masjid, is one of a series of buildings, all built within 50 miles of each other, at Rajmahal, at Gaur in Malda, and in Pandua; the dates of almost every one of them, (the important exception being the Masjid at Rajmahal) are well known, and the material is almost identical. The largest and most important of them all, and indeed the largest Masjid in Bengal, I might almost have said in India, but for the circumstance that I happened to be the officer who, in investigating the remains at Delhi discovered (see Vol. IV. arch rep. Cunningham) the real dimensions of the great Alai Masjid the Kutab Masjid as enlarged, or rather in course of being enlarged, by the great Alauddin; is the Adina Masjid; of which alone the drawings are ready; of the others the drawings are only in progress and will not be in a state to begin writing about, till the close of this current recess season 1888-89.

Had I my way in the writing of the report, I would have deferred writing the technical report on this great Masjid, till the drawings for the others, were far enough advanced to have enabled me to take up all these Masjids, which form a group by themselves, distinctly, though in a yet undefinable way different, from Muhammadan ecclesiastical architecture elsewhere; it would then, and only then have been possible to deal with the subject, in a comprehensive spirit, instituting comparisons, learning myself, and pointing out to others who have less leisure and opportunity to devote to the subject which I am paid to study, the sequence of alterations in the various prominent and minor features: in short; attempting to evolve the principles, which underlying them all, notwithstanding apparent differences, might lead to the discovery, or at learnt render more hopeful the discovery of the laws if any, which the architects observed; and not merely the laws, but the progress, positive or negative, and the tendency of this progress, the growth or the decline, of a great science, as exemplified in actual existing most important examples.

I have in a previous report pointed out, that no complete treatises or even nearly complete treatises on du Architecture exist, or at least are accessible to the general public or to the professional inquirer. The Director General informs me that in the Bombay Survey, a man possesses a complete treatise on the subject, and that the rigid system of subdivision used by Hindu masons, is well known to most people who have interested themselves in the subject; but as all my own research tends to establish quite a different sort of law, a law highly elastic and not rigid, and as I, and I fear many others on the Bengal side of India, do not happen to know of the rigid system of subdivision alluded to, whatever it may be, I can only wish that some one had the courage and the public spirit to render it accessible to the general public interested in such matters, by translation and pnblication.

However this may be, it becomes necessary now to point out what is even stranger, if only to elicit such similar note in regard Muhammadan architecture, as my former note has elicited in regard to Hindu architecture, that absolutely not even a fragment of a work on Indian Muhammadan architecture, has ever (to my knowledge, possibly Bombay possesses them) been found, much less published.

It is simply inconceivable that great buildings, all so far as can now be seen (in the absence of careful scientific comparison) of the same general ensemble, yet different from each other, as men whether in Scotland or in Timbuctoo, resemble, yet differ from each other, could have been built without some salient and universally (as regards them) recognised architectural laws.

Such laws it is manifestly impossible to educe from one or even two examples; what is absolutely needed, is a fairly unbroken sequence, and this sequence by a fortunate accident happens to be available for investigation, in the buildings in Rajmahal, Gaur and Pandua.

The Director General's opinions and orders however, were distinct; and in obedience to them, against my perhaps sanguine or prejudiced, but nevertheless sincere conviction, I

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submit a fragmentary report—fragmentary however only in the sense I have above indicated, but as will be seen, as regards itself alone, as complete as under the circumstances it was possible for me to make it.

I would have preferred writing part I (History and Tradition) of the report, as regards Bengal proper, for which, I had last season, in anticipation, begun to prepare the material. From what Government have already seen of part I of my last report on Anga, I believe it will be admitted, that a report on Banga (the adjacent great political state to ancient Anga) would have appropriately followed it, as gradually disposing, so far as their history and tradition were concerned, of the various great ancient kingdoms, which being conterminous, could not but have many note-worthy points in common, and could not but have acted and reacted, and had intimate dealings with each other; had time permitted, Magadha on the other side of Anga, would have appropriately been next taken up, and indeed in some such hope, I had been collecting material last season for Magadha also. My time would have thus been fully and usefully occupied, and although as regards personal labor, it would have been necessary for me to have labored harder in carrying out my own programme, I would also as compensation, naturally have enjoyed greater pleasure, for it is a truism, that in doing what one feels an interest in, the greater the labor, the higher the pleasure.

In carrying out the orders of the Director General, I have obtained some little relief from intense mental labor, and for this my thanks are assuredly due to him; it does not appear to me however that the Government which pays me has quite obtained the maximum of what they might have otherwise obtained, for the money which I have drawn as salary, although they have got a fair adequate return.

The drawings which accompany, and are detailed in the accompanying list, have all been measured and drawn by the able draftsman of the survey Babu Raj Mohan Banerjya. As he has been recently dismissed from this survey, and this is probably the last work he will have done in the archœological survey, it is only ordinary justice to him, that I should unhesitatingly and fully acknowledge, my great obligations to him. Without him, these drawings would in all probability, not have been ready by this time, if indeed the proposed staff of cheap (30 Rupees a month) draftsmen, could have executed them at all, while his powers of observation have been such, that I have received very material assistance from him in drawing up my report. He has read this report at my request, and endorses my views except where I have specifically mentioned that we differ.

A few words are necessary in reference to the drawings: They are all drawn to a scale of $\frac{1}{20}$ except the index plate which is on a scale of $\frac{1}{1200}$, plate 24 or a scale of $\frac{1}{300}$, and plates 25 to 87 which are drawn full size and which shew the ornamental work.

On such a scale as $\frac{1}{20}$ it was inevitable that the drawings or at least some of them, should be very large, but on this point, with the distinct order of the Director General to make the drawings larger than they are finally intended to be in publication, preferably four times as large, no further explanation from me is necessary; should it however appear desirable that the aid of the Government School of Art be obtained, in publishing the drawings in future, in ordinary lithography, which, from some specimens that the School has executed, appears quite suited to the work of the Bengal Circle, instead of in photographically reduced collotype, not only will it in future, not be necessary to make the drawings larger than finally intended, but the cost of publication will be so considerably reduced, as to bring a volume with a hundred plates, well within the means of the poorer students of Indian Architecture. This is a point on which I can however only offer respectful suggestions for the consideration of Government.

In making the drawings it has been my aim to restore, as far as such restoration was possible with absolute certainty, those parts which are defective. For instance the various cornices shewn as perfect, are not so, but one moulding occurs in some one partly broken portion, and another moulding occurs in some other broken part of the same cornice, I have put together all these fragments, of whose actual existence, and relative positions, there can he no possible doubt, and thus restored the original cornice which has been shewn as intact in the drawings; but there is nothing in the drawings to shew that these parts really thus pieced together are not now in good order in the buildings.

It may he objected that the drawings consequently do not shew the building as it is, but rather as it was when fresh from the architects hand; I admit that this is so, and consider that I am right in doing what I have done, for I really do not see, on what principle the drawings could shew some dilapidations and not others, while it is at the same time obvious, that if every dilapidation, is to be shewn, such as every missing brick or stone or ornament or patch of plaster the drawing will become simply unintelligible, to say nothing of the time lost and labor incurred, in first measuring and noting, and next in drawing them.

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For those therefore who wish to see the actual condition of the building, these drawings are not meant, but I have on careful consideration thought it desirable to supplement these technical drawings with photographs, from which those who so desire, may see the actual state of the building, in much detail; they may also consult Ravenshaw's work for this purpose.

These photographs are also useful for demonstrating, if ever the necessity should arise, the accuracy of my restorations.

But there are portions of which no traces exist at all, and for restoring which with absolute certainty, I possess no materials; these I have restored (so as not to destroy the appearance of the drawing) to the best of my judgment, from examples elsewhere. Such conjectural restorations are shewn in dotted lines as distinguished from the full lines, in which the restorations, regarding which I possess absolute proofs, are shewn. On these restorations, while urging and mainting my views, I am open to correction, and shall thankfully accept such correction as may be shewn to be necessary.

It will be seen from the text that there are frequent, and indeed unavoidable references to photographs, and the report would not be so lucid without these references as with. But the remuneration offered by the Director General for photographs, did not sueceed in attracting a single plate, as indeed it could not, the remuneration being (I have good authority for saying so) insufficient.

I happened however to possess the needful photographs, done when I was not a servant of Government in the Archœological Department, and as the necessity of these photographs, rendered itself evident to me, in the course of writing the report, I have ventured to avail myself of them in illustrating this report.

It will be seen, that the plan of the Masjid given in Ravenshaw and in Cunningham, do not agree with each other, nor with mine. I have carefully verified the correctness of mine however, by independent measurements done, by the draftsman, and by myself personally, and I am satisfied, both Cunningham and Ravenshaw were in error: nor is this to be wondered at when it is remembered that the place was a dense jangal through which narrow paths had to be cut to enable Ravenshaw to take the needful photographs; "a gang of two hundred men" being employed for the purpose.

The photographs as given by Ravenshaw and those now submitted also differ; those now submitted being complete photographs of parts which in Ravenshaw's time were buried in rubbish, but over and above this, there are differences, as portions then intact, have since fallen.

That much of the ornamental and sculptured stone, of this Masjid has been carried away in recent times, is certain; several are now in the Calcutta Museum, while others I know, had been packed for despatch to England, by the then Magistrate of the district Mr. Porch.

Thus much with reference to the field work, treated in detail in this report: but there has been more work done this season.

The drawings now in progress, and which will be advanced enough to write about, at the close of the current recess season, are detailed in the following listy; all of them will it is expected be finished so far as the pencil work is concerned, and it is hoped will be inked in during the ensuing field season while I will be in camp, by the draftsmen at Head-Quarters, ready against the next recess.

As regards Mr. Garrick's work, the whole of the drawings in the list III below, which pertain to Rohtasgarh have been or are to be executed by him, it is hoped they will be delivered ready by the 15th October, as also his report for the past field season. The drawings include those measured, and executed, which are expected to be finished; during the past as well as the current season.

There will then still remain for measurement and drawing, the drawings as per list IV which accompanies; it will be seen that 20 drawings have yet to be measured for and drawn, before a complete report on Rohtasgarh can be written.

Government have sanctioned Mr. Garrick's leave with the proviso, that his work should be sent in on the 15th October, and as this report and its accompanying drawings (in fact the season's report) has to be submitted by the 15th September, and Mr. Garrick is on leave, and his work cannot be expected till the 15th October, his drawings and report do not accompany.

Besides these, the lists below give further, a detail of the drawings which have reference to the report submitted by me last season, but which were returned by the Director General, and are now in this office: and a detail of the drawings for which material exists in this office.

The drawings sent with Mr. Garrick's report of last season, but which for reasons elsewhere given, I had not an opportunity of seeing, have been returned direct to him by the Director General; they are not in my office, have not passed through my office, nor do I possess any details regarding them.

As regards discoveries of inscriptions during the past field season they have been already detailed in full in the prescribed form, and incorporated in the "list of Bengal Inscriptions," and

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need not be further detailed here. The original impressions themselves have also been already submitted to the Director General.

In conclusion I beg to represent, that when the report on the Gaur and Rajmahal buildings comes to be written, it will be necessary that the drawings of the Adina Masjid now submitted be returned to me to enable the subject being treated in a comprehensive manner and the needful comparison with the Adina Masjid instituted.

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LIST I.—Drawings which accompany this Report.

No.	DETAILS OF DRAWINGS.	SCALE	SIZE.
	Index Plate	$\frac{1}{1200}$	Single 4 to.
1	Elevation of South West corner	$\frac{1}{20}$	Octuple 4to.
2	Part plan and elevation of East Face		Qdrple. 4 to.
3	Section of East cloisters		Qdrple.4 to.
4	Plan of abutment of face of main vault (on line A. B. see plate 5) and Section on line C. D., ...		Sextple.4to.
5	Details of main vault, half elevation main vault and abutment		Twelve 4 to.
6	Details of main vault Section on line G. H., (see plate 5)		Twelve 4 to.
7	Plan at A. B., (see plate 8)		Double 4 to.
8	Elevation of back of West wall from centre of Masjid to centre of back entrance		Sexple. 4to.
9	Section on line C. D., (see plate 7)		Double 4to.
10	Do. on line E. F., (see plate 7)		Triple 4 to.
11	Section on A² B², (see plate 1) shewing elevation of prayer-niches and cross section of pulpit up to inner cornice of main vault		
12	Section, (see plate 1) upper part (for lower part see plate 11)		Double 4to.
13	Section on line Q. R., (see plate 24)		Double 4to.
14	The pulpit, plans and section on line E. F.		Double 4to.
15	Section on line A. B., (see plate 24) inside elevation of West entrance door		Double 4to.
16	Details of a prayer-niche		Single 4 to.
17	Section on D. E. with details of niches, (see plate 24) ...		Triple 4 to.
18	Details of upper niche on line F. G., (see plate 24) ...		Single 4 to.
19	Section on H. K., shewing doorway to the King's platform, (see plate 24)		Single 4 to.
20	Section on L. M., shewing archway, (see plate 24)		Slngle 4 to.
21	Elevation of West wall shewing doorway N., (see plate 24)		Double 4 to.
22	Section on line O. N. P., (see plate 24) ...		Octuple 4to.
23	Details of the Fourth prayer-niche from North end on the West wall		Double 4to.
24	Plan. North-West end and Section on line S. S. ...	$\frac{1}{300}$	Single 4 to.
	DETAILS OF ORNAMENTS.		
25	Index plate for side and main prayer-niches	$\frac{1}{20}$	Single 4 to.
26 to 54	Details of Ornaments	full size.	17 Single & 12 Double
55	Index plate for pulpit	$\frac{1}{20}$	Single 4 to.
56 to 64	Details of Ornaments	full size.	Single
65	Index plate for niches in King's platform	$\frac{1}{20}$	Single 4 to.
66 to 87	Details of Ornsments	full size.	16 sgle 5 dle. 1 of 16 4to.
88	Impression of an inscription found in the ruins ...	f. s.	Single 4 to.
89	View of S W. Corner tower	Photographs.	Size of Photographs 10"×8"
90	Do. King Chamber		
91	Do. a doorway of King's Chamber		
92	Do. a niche in King's platform		
93	Do. a niche in N. W. Cloisters		
94	Do. pulpit and main prayer niche		
95	Do. main prayer niche		
96	Do. side prayer niche		
97	Do. niche at back of pulpit		
98	Do. shewing ribs of vault		
99 100	Do. of plaster work in spandrils and of ornamental arch filling		
101 to108	Do. of ornamental arch filling of different patterns		
109	General view West wall		
110	Do. East wall		

Total 88 plates and 22 photographs.

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LIST II.—Finished drawings returned by the Director General Archæological Survey, to the Archæological Surveyor, Bengal, and now in his office.

		SCALE.	SIZE.
1	Temple at Umga, elevation and plan ...	$\frac{1}{60}$	Quadruple 4to.
2	Temple at Umga, section across ...	$\frac{1}{60}$	Double 4to.
3	Temple at Umja, section longitudinal ...	$\frac{1}{60}$	Double 4to.
4	Temple at Umga, diagrams illustrating composition	$\frac{1}{300}$	4to.
5	Temple at Umga, details	$\frac{1}{20}$	Double 4to.
1	Temple at Chakdah, plan elevation section and details	$\frac{1}{30}$	Octuple 4to.

LIST III.—Drawings expected to be received by the 15th October with Mr. Garrick's report, and relating to Rohtasgarh, measured and drawn, or being drawn by Mr. H. B. W. Garrick, Assistant Archæological Surveyor, Bengal, during field Seasons; 1886-87 ; 1887-88.

No.	TITLE AND DETAIL.	SCALE.
1	Small Temple at foot of Rohtasan plan	$\frac{1}{30}$
1	Rohtasan Temple, elevation of West face	$\frac{1}{30}$
1	Do. Section E. W.	$\frac{1}{60}$
1	Ganeç Temple, section	$\frac{1}{20}$
1	Lal Darwaza, plan	...
1	Singh Darwaza, plan	...
1	Kathautiya Darwaza, plan	...
1	Raj Ghat Gate, plan	...
1	Habshis Tomb, plan	$\frac{1}{60}$
3	Baradwari, plans	...
1	Baradwari, elevation East face	$\frac{1}{30}$
1	Baradwari, elevation North face	$\frac{1}{30}$
1	Section of Baradwari	$\frac{1}{20}$
1	Details of Baradwari	$\frac{1}{10}$
2	Shish Mahal, plans	$\frac{1}{60}$
1	Shish Mahal, section	$\frac{1}{30}$
1	Phul Mahal, plan	$\frac{1}{30}$
1	Diwan-i-Am, elevation of first floor	...
1	Diwan-i-Am, plan first floor	...

Total 22 drawings of the Rohtas buildings measured and drawn during the Seasons 1886-87 and 1887-88.

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LIST IV.—Drawings proposed to be measured and drawn during the ensuing field Season, by Mr. H. B. W. Garrick being the yet unfinished balance of the programmes of 1885-86, 1886-87 and 1887-88.

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1 Sheet of details of Rohtasan Temple.

1 Plan of large or Rohtasan Temple.

1 Plan of the Ganeç Temple.

1 Section of the Raj Ghat Gate looking towards the Son River.

1 Section of South half and elevation of North half of the Kathautiya Gate looking to West.

1 Plan of Masjid attached to the Habshis Tomb.

1 Block plan shewing Cloisters and Privies as well as main building. Shish Mahal ; ground floor in full, upper floor dotted in.

2 Sheets of details of Shish Mahal and Cloisters.

1 Plan of Hammam and Privies attached.

1 Section of Phul Mahal complete.

1 Diwan-i-Am, complete section shewing Vaults in ground floor, as well as Towers above, looking South.

1 Plan of 2nd floor, and of Towers and Stairs, Diwan-i-Am.

2 Sheets of details.

1 Plan ground floor of the Hathiya Pol.

1 „ upper floor and of Towers Hathiya Pol.

1 Elevation of North half and section of South half looking East, of the Hathiya Pol.

1 Cross section of the Hathiya Pol looking South.

1 Sheet of details of the Hathiya Pol.

Total 20 drawings yet needed to complete the illustration of the buildings in Rohtasjarh before they can be written about in a comprehensive spirit, or a complete report on Rohtasgarh can be drawn up.

Besides these, there are needed some more drawings of the Tomb of Sher Shah at Sasseram not yet drawn so as to fully illustrate for technical purposes this most Noble of all Mausoleums in Bengal.

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LIST V.—Drawings in progress, with detail of their state of progress, but which do not accompany this report, the measurements for them were made during the last season except for Konch which was measured 1886-87,

	GAUR.	STATE OF PROGRESS	SCALE.	SIZE.
1	Kadam Rasul Masjid, half ground plan half plan at roof	Drawn in pencil	1/50	Double 4to.
2	Kadam Rasul, half elevation and half section ..	Drawn in pencil except ornamental mouldings	1/50	Do.
3	Kadam Rasul, details	Drawn in pencil.	1/20 & 1/5	Do.
4	Plan and elevation of Tomb in the Court of the Kadam Rasul	Finished except printing	1/50	Do.
1	Small Sona Masjid plan	Drawn in pencil	1/50	Triple 4to.
2	Small Sona Masjid half elevation half section ..	Drawn in pencil except ornamental mouldings	1/60	Do.
3	Cross section and details of small Sona Masjid ..	Drawn in pencil except ornamental mouldings	1/60	Do.
4	Details of small Sona Masjid..	Drawn in pencil.	1/60	Double 4to.
	RAJMAHAL.			
1	Ground plan of the Jama Masjid	Finished in ink except printing	1/60	Qdple. 4to.
2	Half elevation half section of the Jama Masjid ..	Do.	1/60	Sextuple 4to.
3	Section of the Jama Masjid on line G. H.	Do.	1/60	Double 4to.
4	Plan of the roof of the Jama Masjid	Do.	1/60	Qdple. 4to.
5	Block plan of the Jama Masjid and Court ..	Do.	1/200	Double 4to.
6	Back elevation of the Jama Masjid and section through Court	Do.	1/200	Do.
7	South gateway of the Jama Masjid plans elevations, and section	Drawn in pencil	1/40	Qdple. 4to.
8	East gateway of the Jama Masjid, plan, elevations and section, ...	Do.	1/40	Do.
9	Plan of upper story at end..	Do.	1/60	Double 4to.
10	Section of the Jama Masjid on line A. B. C. D. E. F.	Do.	1/60	Do.
1	Plan of the Baradwari	Do.	1/60	Do.
1	Temple behind Masjid, plan, elevation and section	Do.	1/20	Do.
1	Bridge over the Tinuah Nala plans	Do.	1/60	Qdple. 4to.
2	Bridge over the Tinuah Nala elevation and section	Do.	1/60	Do.
	CHHAPRA.			
1	Tomb at Chhapra plan	Finished.	1/60	Double 4to.
2	Tomb at Chhapra elevation and section ..	Finished.	1/60	Do.
	CHAYANPUR.			
1	Tomb at Chayanpur index plan	Partly done in pencil.	1/300	Do.
2	Plan of tomb proper at Chayanpur		1/60	Triple 4 to.
3	Plan of tomb proper in Chayanpur at the pavilions	Do.	1/60	Do.
4	Tomb at Chayanpur half elevation, half section of tomb proper	Do.	1/60	Qdple. 4to.
5	Tomb at Chayanpur main gate plans	Do.	1/60	Single 4to.
6	Tomb at Chayanpur, main gate, elevation ..	Do.	1/60	Do.
7	Tomb at Chayanpur main gate, section.. ..	Do.	1/60	Do.
8	Tomb at Chayanpur, corner pavilions, elevation and section	Do.	1/60	Do.
	KONCH.			
1	Temple plan	Finished.	1/60	4 to
2	Temple half elevation half section side	Do.	1/60	Double 4to.
3	Temple half elevation half section back ..	Do.	1/60	Do.
4	Details of ornament Temple..	Do.	Full size.	Qdple. 4to.
5	Details of moulding Temple..	Do.	1/20	Single 4to.

Total 37 plates equal to 91 Quarto plates.

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West, with anything like the same *certainty*, though still with a high degree of probability.

Whether the architect, or his employer, determined the size of the Masjid, it is now impossible to ascertain; all that can be ascertained is, what the architect did; and this appears to have been what the architect did; he drew a line due North and South, within, and bounded by the old inclosure walls, and took that for the length of his Masjid.

Further it will be seen, that the distance of this, due North and South line, of the West wall of the Masjid, is not fixed at random; the line is drawn, just at such a distance from the old boundary wall, as to leave room, (1) for the so-called King's vestibule V., and (2) for a necessary closet C.; which, as an impure place, had necessarily to be kept separate, not touching the Holy place of prayer. The West wall of the Masjid it will be seen, barely leaves room for these. A further circumstance which may and possibly did determine, the position of the West wall of the Masjid, is, that in all probability, the sanctum of the temple, judging from the remnants of heavy pedestals of statues, now built into the pulpit, and the superb canopied trefoils, now doing duty as prayer niches, stood where the main prayer niche now stands; nothing would probably so tickle the fancy of a bigot, as the power of placing the sanctum of his orthodox cult, (in this case the main prayer niche) on the spot, where the hated infidel had his sanctum; and utilising to the honor of his own religion, the very canopies of the idolatrous statues; for there is no doubt whatever in my mind, comparing these trefoils with the recently discovered similar trefoils at Kylas over figures of Parvati, (see report Part I of last year) that these trefoils are really the canopies over the statues, originally inshrined here.

Further it will be seen, that the postern D., is brought up, as close as possible, to the main nave; it obviously could not be put within the nave, but it was at the same time, necessary to bring it as close to it as possible, so as to nearly face the existing old entrance E. in the existing ancient inclosure wall; and this probably for the reason, that this entrance, which, as now seen, is merely a bit of brickwork, was then, an elaborately adorned stone faced gateway, of which, now, the stones have disappeared.

That many stones have disappeared from the Adina Masjid, may perhaps best be conjectured from plate 31 Ravenshaw; the door lintels there shewn, or others similar, (for the Photograph is not quite clear enough to enable the point to be exactly determined) are now in the India Museum; and I have myself seen, in the compound of the then magistrate of Malda, the late Mr. Porch, a set of lintels obtained from Pandua, which he, when going on his last furlough, packed up and carried off to England.

But if, as appears now certain, the procedure adopted by the architect, was to fill the old court, as regards the direction N. and S. with his Masjid, it is not improbable, that a similar procedure was followed, in regard to its breadth East and West.

And this is rendered all the more probable by the circumstance, that if the temple inclosure were an exact square, in accordance with a widely prevailing custom in Banga, (as contradistinguished from other parts of India) of which examples enough may be found in Montgomery Martin's (Buchanan's) Eastern India, and a square on the now ascertained ancient West side P. P′. be described, as done by the dotted lines P. P′. P″. P‴, the South-East corner of the Masjid, also falls, close enough to the line of walling, so conjecturally drawn, to justify the inference, that thus also was the breadth of the Masjid determined.

Of course it is obvious, that one corner of the Masjid, if so drawn, must necessarily fall beyond the old inclosure, but it will be seen, that under the conditions already detailed, the maximum of size for the Masjid, has been secured, by the arrangement adopted.

I accordingly conclude, not indeed as certain, but as reasonably probable, that the ancient Temple inclosure, was, more or less, (due to architects errors of setting out and construction) a square of about 495 feet side.

How many Temples stood within it, is a more difficult question to answer: five stone carved door frames, and one plain stone gateway, now exist in the Masjid as doorways; the jambs of one appear to have been utilised in the upper horizontal sculptured stones, over the central prayer niche in the nave, and I am aware of two, which have assuredly been removed; besides these, the stone sculptured pillars ornamenting the niche N. (see plate 23) appear to me to have belonged to a doorway of a subordinate Temple, as the very figures (flying figures) projecting from the sides of the jambs, which invariably occur in the earlier Gupta doorways exist, sadly mutilated it is true, but unmistakeable, as well as the lower figures at the sides, once hidden away by the Muhammadan architect behind a smooth facing in the spaces S. S., (pl. 23) but now exposed. There is consequently indisputable record of 10 doorways; and as each Temple must have had 4 doorways, supposing it to have had a sanctum as well as the outer Hall with a door in the sanctum, one in the front, and a door at each projecting cross limb of the transept, (the maximum number in a complete un-

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ARCHÆOLOGICAL SURVEY OF BENGAL.

PART II.

1888.

ARCHITECTURE AND ART.

REPORT.

The Masjid of Adina, the subject of this report, is situated about a mile and a half to the North of the small village of Pandua, in the Malda district; it stands by the side, and to the right of the present (which happens to be also the ancient) road from Gaur and Malda to Dinajpur.

The building consists of a great nave, once roofed over by a pointed tunnel vault, but now, roofless, and open in front towards the East; flanked on each side by 18 aisles, also mostly roofless, facing an oblong open courtyard, the other three sides of which, are also fronted by aisles, less in depth, but of the same general character. The external dimensions of the building being 516′-0″ × 313′-0″ and that of the inclosed court 419′-0″ × 186′-0″. From the external West face, a little to the North of its middle, projects the remains of a square (now roofless) chamber, 54′-0″ × 48′-0″ in external dimensions; and in continuation of this, northwards, projects a second chamber, (also roofless) 41′-0″ × 41′-0″ in which an outer entrance and ramp, gave access to the raised floor of the first projecting chamber.

This building with its projections, stands within an outer inclosure, of irregular shape, which appears to have been bounded on three sides, the N. W. and S. by walls; and on the East by a wall and a pair of tanks: One entrance in the West wall opening from the road, and an open space or road, between the pair of tanks on the East, forming the entrances to this inclosure.

It is probable, judging from a low, narrow, long mound, to the East of the pair of tanks, that the North and South inclosure walls, were continued eastwards beyond the points marked on the plate, (Index plate) on to the line of low narrow mound just mentioned, which runs North and South at about 50 ft. distance from the tank; when they turned, forming the East boundary wall; with some sort of gateway in the middle. Here indeed the height and conspicuousness of the mound, indicates, that some building once stood; but as no examination by excavations was made in these mounds, it would be purely a conjectural plan, to so extend the lines of walls: the portion marked on the plate, defines that part, of which remains were actually found in situ, and ascertained, beyond possibility of doubt, to have formed a continuous narrow line of walling.

Outside the inclosure walls, runs on the West, the present road from Malda to Dinajpur; the road as at present, is not exactly parallel to the wall; but this is doubtless due to the inevitable slight variations, which all kacha roads continuously undergo, by the traffic abandoning the cut up portions of the road, for the comparatively firmer ground on the sides. This road however, is the ancient road, which is said to have been made, or commenced, by Ghiasuddin Iwaz about A. D. 1211.

In Part I will be found reasons for identifying Gaur, with the capital of Hiouen Thsang's Kietchou-ou-Khilo (Kie-chu-Hou-Khi-lo of Beal) but even if this identification be not admitted, there is no doubt of Gaur having been for many years, previous to the Muhammadan invasion, certainly during the rule of the Senas, the capital of some of the earlier Senas, as well as of the last unfortunate Hindu King. From this capital Gaur, roads would naturally radiate to Hiouen Thsang Pūnnafatanna, (which I agree with Cunningham in identifying with Mastangarh) and to other places of note around; one certainly to Devikot, (near Dinajpur) which assuredly was an ancient capital, and continued to be a place of note, down to the Muhammadan period, as it is mentioned by their historians (Cunningham reports XV.) This road, would necessarily run past the site of the Adina Masjid, to avoid the marshes, which a road, crossing the then course of the Ganges lower down, would have to encounter; the road therefore, dates to a period, long anterior to the Muhammadan invasion, and the Muhammadan historians' record of the making of the road, would refer to the embanking and paving of the already existing track.

That this is so, is rendered certain by the circumstance, that the entire road, wherever not overlaid by recent embankment, or cut through, is actually paved, with a layer of brick on edge, along the entire distance, so far as I have seen it, for a width of 15 to 18 feet:—the bricks being, not the large Hindu bricks of 18″ × 12″, or even the mediœval 10″ × 8″, but the small Muhammadan brick of which the Masjid is built.

But though the road is paved, and the Masjid built, of the small Muhammadan brick, (except in the arches where the

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bricks are large) the West boundary wall of the Masjid, is built, not of the small Muhammadan brick, but of the large Hindu brick; and it runs, not parallel to the Masjid, which a boundary wall *built for the Masjid* would do, but parallel, and indeed along the right side of the *road;* its direction being, so far as can be seen, dependant, not on the Masjid, but on the pre-existing road.

These facts would render extremely probable, that the West boundary wall existed prior to the Masjid, and indeed prior to the Muhammadan period; but fortunately it is not necessary, in the case of this wall, to confine ones self to probabilities; there is the most conclusive evidence of the absolute certainty of the wall being pre-Muhammadan.

It will be seen (Index plate) that in the West boundary wall, is an entrance, and careful examination of the drawing, (it is on a small scale) will shew, that at this opening, the straight thin wall, is thickened by successive projections from its surfaces, both inwards and outwards; the result is, that the entrance itself is a narrow passage between the thus formed two rather deep jambs.

But what is curious is, that the two jambs forming the side walls of the passage, are not parallel; the width of the opening at the outer, or road end of the passage, being just barely 6 feet while that of the inner or Masjid end is 6′-9″.

What is still more curious is, that while the right jamb (on entering) has a smooth even surface, as also have the projecting facets, the left one has, for the most part, a rough surface, as if the bricks had been cut, after they had been built; although the facets, both in and out, have smooth surfaces.

And lastly it will be seen, that while the Southern jamb is perpendicular to the direction of the wall, the Northern jamb makes an angle which is very far from a right angle, with the direction of the wall; and that, the prolongation of its surface, falls on the little postern in the West wall of the Masjid.

It is impossible that the North jamb alone should have been built originally, askew to the direction of the wall, and unconformable to the South jamb; for if, by reason of the position of the postern, it had been so built, its surface would not have presented the irregular appearance of having been roughly cut, but would have presented the even surface of a wall, originally set out askew; and the South jamb, would have, naturally, also pointed to the postern, and been parallel to the North one; or at the worst, would have been askew to the direction of the inclosure wall to the same degree, but in a symmetrically opposite direction; which it is not.

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The only possible explanation of the irregularity is, that the North jamb was originally built parallel to the South one, as any Architect in his senses would have done, but was subsequently cut to the angle it now has.

And further, that the entrance as originally built, pointed or led, not to the postern in the Masjid, but to some object now not in existence, but which must have been situated somewhere near the place where the main prayer niche of the Masjid now stands; and this is rendered all the more probable, by the existence of the pedestal of some great statue, among the stones which compose the pulpit.

In short it appears, that when the Masjid was built, and the postern in the wall came into use for the Masjid, the North jamb was cut, so as to give a free entrance in the direction of the postern in the back wall of the Masjid.

Consequently therefore, that the entrance, as originally built, was built without any reference to the Masjid; and as it is simply impossible, that if built contemporaneously with, or subsequent to the Masjid, it should have been built without any reference to the Masjid, to which it would have formed an entrance; there is no possibility of avoiding the conclusion, that it dates to a time, anterior to the building of the Masjid.

And taken in connection with the larger brick of which it is built, and the mud cement in which the bricks are set, while the Masjid and its dependencies are built, of stone or brick, invariably set in lime mortar, there is but one reasonable conclusion which can be entertained; that it is a pre-muhammadan remnant. And the further inference is therefore inevitable, that there existed; first the road, along side which, was built this wall of the large Gupta bricks, during the Hindu or pre-muhammadan period, that is at some time during the Gupta rule.

Its alignment consequently, making as it does, an angle of 20 degrees with the longer axis of the Masjid, is dependent, not on the Masjid, but on the direction of the road which it faced.

As a possible, through not certain corollary, it follows, that as Hindu Temples often, and Muhammadan Masjids invariably, are aligned with reference to the cardinal points of the compass, the building, of which this existing fragment of a pre-muhammadan time, formed one inclosure wall, and was presumably parallel to it, could not have been Mahammadan, was probably not Hindu, and therefore was probably Buddhist.

And the second corollary is, that consequently, if there he no error in the argument, some Buddhist remains ought to be discoverable, in or about the place.

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This proof of the correctness of the argument, is fortunately I believe forthcoming. Immediately within, and a little to the East of the West entrance of the West wall, was found the round base of some solid building, across the top of which was found running, a straight wall. As the straight wall appeared to be the wall of some kind of entrance chamber, such as usually, forms the entrance of inclosures for Muhammadan Tombs or Masjids; and as this straight wall was built of the smaller, or Muhammadan brick, the circular solid building below it, must clearly be pre-muhammadan, and consequently very probably a Buddhist Stupa, which so far as I am aware, is the only building which must be both solid and circular.

Possibly, nay probably, its square base or pedestal, still lies buried below the level to which the ground was excavated a few years ago, by order of the Bengal Government; my instructions however, during the past three seasons, did not authorise me, or my staff, to make any excavations in the Adina Masjid, though the cost of such would have been a mere trifle, probably 5 Rupees.

I would respectfully represent, in this connection, that an officer whom the Government can trust with the conduct of the archœological exploration of two provinces; and who has under a former Director General proved himself competent to carry out such extensive excavations, as were successfully accomplished, at Bharhut, in Afghanistan, at Budhha Gaya, in Rohtasgarh, and elsewhere, may, without misgiving, be trusted and empowered on his own authority; and without a lengthy reference to the Director General in each case; to make any such smaller excavation, as may appear to him desirable, so long as the funds at his disposal are not exceeded; even if the programme of proposed operations for the year, which must, from the very nature of the case, be rather an *outline of expected operations*, than a *detailed diary of actual work*, fails to make special mention or to receive the Director General's sanction to, such petty excavations.

If then this circular solid base, which can reasonably be conjectured to be a Stupa, be actually one; and, judging from the size of the bricks, a Stupa of the middle Gupta period; it must stand on a square basement, and this basement would be found built on the original level of the old Court of the Temple.

The debris removed some years ago, by order of the Bengal Government, consisted almost wholly of broken brick and mortar, as may be seen in the extensive mounds around; and it is therefore probable, that the level of the original Hindu Court, has not yet been reached; when earth, or the large Hindu brick or stone slabbing, would have been found.

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The safety of the existing Masjid, must always restrict the wholesale excavation of its Courts, internal and external, to below its present level; but there is no sufficient reason, why partial exploratory trenches, to be carefully filled up again, should not be carried, across such parts of the Court, as will not, even remotely, endanger the safety of the existing buildings.

The discovery of this Stupa, is of importance; as although there never could have been a doubt, of the magnificent, deeply cut floral, and other sculpture, now to be seen in the building, dating to the Hindu period, they might, and indeed have been supposed, to have been brought from Gaur, by the Afghan Kings, who, "to build the public structures of their new capital, plundered Gaur of every monument that could be removed." (Hunter). The discovery of this Stupa however, and the evidence of the boundary wall, whose pre-muhammadan antiquity, is established by the size of the bricks it is composed of, by their being set in mud, (while all the brickwork which is undeniably Muhammadan, are set in lime mortar) and by its unconformable alignment, in regard to the Masjid; proves the existence here, of certainly one group, of pre-muhammadan temples; and relieves the Archœologist, from being constrained to admit, that the pre-mahummadan remains, now seen here, were brought from a distance.

But I will go further; while Executive Engineer, of the Temporary Division of ancient monuments, of the Bengal Public Works, I had exceptional means, not enjoyed by others, of examining the buildings, both at Gaur and at Pandua; I was not then aware of the existence, either of the Stupa, or of the wall (both then buried under 5 feet of rubbish,) but even then it appeared to me, that neither in material, nor in the forms of the floral sculpture, least of all in the persistent recurrence of the trefoil cusped sculptured arches, which form such prominently unmistakeable features of the Hindu work in Pandua, could any resemblance or connection be traced, between them, and the Hindu remains (equally utilised for Muhammadan work) at Gaur; nor, when I looked for the remnants of buildings, wholly or partially dismantled, could I see any in Gaur, that might probably have furnished the materials for Pandua; and though in my ignorance of the former existence of an important group of Hindu Temples at Pandua, I was forced to accept the statement made in the Gazetteer, of Gaur having been dismantled to build Pandua, I did so under reluctant constraint. Now however, with wider knowledge from the excavations, I no longer entertain the idea, of Gaur having been dismantled, to build the Adina Masjid in Pandua nor can I find any original reliable authority for this statement in the Gazetteer.

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But the evidence in support of this new view, is not based solely on what has been said above. Among the debris, during the excavations made by order of the Bengal Government some four years ago, were found, several *fragments* of figures; the fragments so small, that it would be absurd to suppose they were actually carted more than 20 miles from Gaur, to be put into odd corners, to fill up holes between larger blocks of stone, when whole hills of broken brick, must have been available on the spot.

Among these, in the shattered ruins of the core of one of the pillars, in the North end of one of the Western aisles, was found an inscribed fragment of the pedestal of a statue; the inscription is given in plate 88. It is unfortunately but a fragment and gives no information. In the last line the opening letters *pta* might be the second syllable of the word Gupta of which the first syllable *gu*, has got lost in the lost portion, evidently the larger portion, of the pedestal; but there is fortunately in the fragment, a sibilant S., the form of which, is certainly early: I should say 7th century, and by no possibility later than the 8th. Such as it is however, it is a proof, that probably in the 7th, and certainly not later than the 8th century, a Temple, in which statues could be set up for worship, existed here.

It may therefore he assumed, without any reasonable doubt, that assuredly one group of Temples, dating to the 7th century or thereabouts, (if not more than one group) stood on the site of the present Adina Masjid, and that the unconformable orientation of the West boundary wall, with reference to the Masjid, as well as the difference in the material (both in brick and in cementing material) of which it is composed, from the material used in the Masjid, are due to its having been the boundary wall, within which this group of *Temples* stood.

It now remains to ascertain, as far as may be, the size of the original inclosure.

It will be seen (Index plate) that at P., two short lines of wall, run out, at what is practically a right angle, from the line of the West boundary wall, and meet the back wall of the Masjid; while at Q. a longer line of wall, very nearly parallel to the North face of the Masjid, and therefore presumably the North boundary wall of the Masjid, runs to, and beyond the East facade of the Masjid, on to the ghat, which leads down into the Tank marked 1.

As the average distance (at the middle) of this wall from the North face of the Masjid is 62′-0″ while that of the South boundary wall is 65 feet, it is clear, that running nearly parallel to the North and South faces of the Masjid, at about the same distance from them, and built of small Muhammadan brick set in

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mortar, (though the repairs to the North wall made at some subsequent period are set in mud), they are respectively the North and South boundary walls of the Masjid.

What then is the short wall at P?

I cannot but conclude, judging from the construction of the wall, the material (large brick and mud setting) of which it is composed, and the angle (very close upon and therefore practically) 90 degrees, which it makes with the West pre-muhammadan boundary wall, that the Northern of the double line of walls at P., forms the North boundary wall of the old temple inclosure, of which P. formed the North-West corner.

How it happens that this corner escaped being pulled down, or why it was left partially standing, it is now perhaps impossible to determine, though I have guessed that this was done to inclose a Zenana Court, (see infra).

Nor judging from the irregular facing of the inner, or Southern of the two walls at P., can I assign it with *confidence* to the Buddhist period; it may be contemporary with the outer or Northern parallel fragment, and the original Temple boundary wall may have been double, as is often the case elsewhere; but I would rather not pronounce decisively on this question; all that can be affirmed with reasonable certainty is, that P. is the original outer North-West corner of the Temple inclosure, and the Northern of the double line of walls at P. the outer boundary wall.

It is necessary to add, that the portion P. Q. of the West wall, was not found intact; fragments only of the lowest courses were found, the bricks composing these fragments, were small and set in mortar.

If then P. was the North-West corner, and E. clearly the North entrance, of the original temple inclosure; assuming as is natural, that this entrance was situated in the centre of the wall, the length of this, the West face of the inclosure, would be 495 feet, or double the distance between E., and P.; and the South-West corner would fall at P′. (see index plan).

The portion of boundary wall from a point to the North of P′. to R. has been conjecturally put in, and therefore in dotted lines; no part of it was actually exhumed, nor was the corner Q′., nor the point P′. actually exhumed and seen. There is however little doubt, that if they still exist, excavation would bring them to light.

The inclosure therefore, within which the Temples of Adina stood, measured 495 feet North and South: unfortunately, there are no means of defining the extent of the inclosure, East and

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LIST VI.—Drawings for which complete materials exist but which have not yet been drawn, on Whatman's drawing paper as ordered by the Director General; with remarks as to when the materials were obtained.

Tomb at Shamshernagar, measured season 1887-87	This will make probably 2 plates.
Fortified Serai and gateways and masjid at Daudnagar, measured season 1887-88 ...	This will make probably 5 plates.
Tomb, Tank, Ghat, and Masjid at Maner measured season 1887-88	This will make probably 25 plates.
Tomb of Hasan Khan at Sasseram measured season 1885-86	This will make probably 20 plates.
Temples at Kylas in Bhagalpur District measured season 1885-86	2 plates.
Temples in the nameless new fort near Umga measured season 1885-86	4 plates.
Miscellaneous, measured season 1885-86 ...	2 plates.

Total material on hand to be worked up probably into 60 plates besides photographs.

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altered large Temple) there must have been at least 3 Temples; but as several door frames have probably got lost, beyond record, it would not be an extravagant estimate, to assume 9 Temples (a common and favorite Hindu number, the *navaratna*) as having been destroyed, to build the Masjid; that is a great Central Temple, 4 Subordinate Temples facing the four sides, and 4 Subordinate Temples opposite the 4 corners of the great shrine. In any case, the least that can be estimated, is 5 Temples; *viz.*, the great central shrine, with a Subordinate Temple facing each side; also a favorite number (the *pancharatna*) with Hindu architects, as having been destroyed to build the Masjid.

I have not included the cusped trefoil sculptured arches of the prayer niches in the nave, as having formed doorways; because, as has been already mentioned, there is reason to believe, that they were not doorways, but the ornamented canopies, over the statues that were inshrined, in these Temples.

There cannot, it appears to me, now, exist any reasonable doubt, that the Adina Masjid occupies the site, of a once famous, or at least a most important, and highly ornamented, pre-muhammadan shrine; but as collateral evidence of it, may be added the circumstance, that at certain times of the year, not only Muhammadans, but Hindus also in large numbers, flock in pilgrimage to the Masjid; and this Hindu pilgrimage, is probably a relic of the pilgrimage made by their ancestors, to the demolished Temple.

But if the Adina Masjid occupies the site of a Hindu (pre-muhammadan) Temple, may not the name itself be a reminiscence of the original name? I am aware that Adineh means Friday, and the name Adina Masjid has been taken to mean. "Friday Mosque" but on the face of it, the explanation is as unsatisfactory, as it would be to call a church the "Sunday Church," as necessarily all mosques, are in fact, "Friday Mosques;" further, the name, is not Adineh, but Adina. I would preferably, remembering that the sculptures (as will be shewn further on) prove the Temple to date to the 7th century, connect the name, with Adisur, and I would connect Adisur with Aditya Sena Deva, as an alias.

It is well known that the various Gupta Kings, both before and after Aditya Sena Deva, assumed (or the people gave them) various titles; there are no such for Aditya Sena. What more likely than that, in recognition, or as a mark, of his Hindu orthodoxy, the Great Aditya Sena should have been also known as Adisur? No King equal to him in power, had sway over Bengal about the period which tradition would assign to the Adisur who reformed the religions heirarchy of Bengal, nor is it any way possible to ignore the universal tradition of Adisur, as a King of Bengal

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and as the King, who went the length of importing learned Brahmans from Kananj, to reform the effete Brahmanic heirarchy of Bengal, while the known and staunch orthodoxy of Aditya Sena Deva, as well as his undoubted vast power, must point to *him,* more than to any other king, as the one, who, with the *power,* was at the same time, the only one, with any probability of possessing the *will,* to introduce such a gigantic reform into his eastern provinces, and who, above all others, would merit the title of "Sura" to his name—just as in this very part of India the anonymous title of "Asura" has been attached to the similarly great Raja Bana, whose traditions are current all over the surrounding districts, and who is universally in this part of India, and even as far as Gaya known as "Ban Asura." In short as a purely speculative, but nevertheless most probable theory, I consider, that the Adisur of Bengal tradition, is no other than the mighty Aditya Sena Deva of the Gupta dynasty; and consequently, differing from Cunningham in some other points, I agree with him, that the Senas of Bengal, are the direct descendants of this great king, who, as is only too common in Hindu dynasties, probably at his death, parcelled out his mighty empire among his sons.

And this inference is borne out by the circumstance, that Aditya Sena's son and successor, in the kingdom of Anga, (and Suzerainty of Magadha and Bengal) did not by far, approach his father in regal power, a circumstance easily accounted for, if the province of Bengal were assigned to another son, leaving only a nominal Suzerainty to the successor of the great Aditya in Suzerain power.

Further, as I have in a previous report pointed out; quite independent of the questions now being discussed; there can be no reasonable doubt of Aditya Sena (and the Gupta dynasty in fact) having belonged to the lunar race. I see the learned Dr. Rajendra Lala, on the strength of inscriptions, concludes that the Senas of Bengal belonged to the lunar race. How in face of this, and the sum of the other probabilities, all tending in one direction, can the supposition be set aside, as unworthy of being brought forward, (even if it be for adverse discussion merely) that, (1) The Senas of Bengal are the descendants of Aditya Sena Deva, a supposition wherein Cunningham and Rajendra both support me.

(2). That the Senas of Bengal belonged to the lunar race, in which I have Raja Rajendra's support.

(3). That the Adisur of Bengal traditions, is no other than the great Aditya Sena Deva.

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The elucidation of truth is the object of all research, and this must be my plea for bringing into prominence, not for adoption without examination, but for discussion, with a hope of final adoption, what is supported by the entire weight of probability, so far as present Archœological research goes.

My difficulty lies not here, but in quite a different direction· It is impossible to ignore the existence of that solid round building S. near the West wall of the Adina Masjid, nor do I see how it could have been anything but a Stupa; if so, how could Aditya Sena Deva or Adisur (as I must now provisionally for Bengal, call him) orthodox Hindu as he was, have built the temple? If he did not, could his son or his grandson have been Buddhist, and built it? Later than this, it is not possible to bring down the date of the Temple.

Where was Aditya Senas' capital? he could scarcely have dwelt in Anga, except as Harsha Varddhanas vassal, and this, Hiouen Thsang's silence renders improbable. Was it then that his capital was at what is now known as Pandua, *but whose ancient name was some derivative of Adisur, of which a reminiscence is preserved in the name Adina, of the Masjid, which stands, where his capital once stood?* Was he compelled during Harsha Varddhanas' reign to conform to Buddhism, and to build a grand Buddhist Temple in his capital, to save himself from deposition or death at the hands of that zealous Buddhist? and may his subsequent excess of zeal in orthodox Hinduism, and his grand reform in the Bramhanical heirarchy, as soon as Harsha Varddhanas' death, left him freedom of choice and power, be, but the natural reaction from an enforced profession, of a faith he could not sincerely believe in? The questions are of great interest, but at the present stage of research I connot presume to reply to them with assurance; I can only say, that my own convictions would lead me to answer the queries in the affirmative.

It is but fair to add, that I believe it is the opinion of the present Director General, that the circular basement, S. alluded to, (Index plate) is not a Stupa; could I agree with his view, or should exploration prove my suppposition, of its being a Stupa, wrong, all my difficulty would vanish, and the Temple, which once stood within the inclosure, would be a Hindu not a Buddhist Temple and therefore most appropriately built by the great Hindu King Aditya Sena Deva.

The circumstance of its not having been aligned North and South or East and West would be no difficulty, as although the cases are rare, there are not wanting instances, of such irregular alignments, in Hindu Brahmanical Temples.

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It is also fair to add that the opinion of the draftsman of the Survey, Babu Rajmohan Banerjya, who has minutely measured the Masjid, and by whom every plate which accompanies this report has been both measured and drawn, is adverse to my view, and agrees with the opinion of the Director General in regarding the basement S., as *not* a Stupa ; his idea that it was a *well*, and the conjecture of the Director General that it is the base of a minar, appear to me however to be both rendered untenable, by the *fact* which no theory can ignore, (1) of a straight wall having been built across it as shewn by the dotted line L. L. a wall actually seen in situ by me personally during the course of the excavations before it was necessarily dismantled and removed ; (2) by its standing absolutely straight in front of, and in the direct line, from the entrance in the inclosure, to the postern D. in the Masjid.

At the same time, in adverse evidence, to these temples having been Buddhist, is the actual existence of an Argha (the Sistrum for the round ended cylinder which is the Hindu phallic emblem), actually lying in the East cloisters, and evidently fallen out from the obscurity, into which the Muhammadan Architect had built it in, and the existence of the corresponding cylinder for it, now strangely enough, occupying a prominent position, (not however as a symbol of the Divinity, but as an ornamental finial, and laid horizontally, with its rounded end jutting out boldly) in the inner end, or West wall, of the great nave at L. plate 12. I have carefully examined this stone, with the aid of scaffolding, and so has Babu Rajmohan Banerjya, the draftsman, and we agree in considering this stone at L., to have been originally a lingam, and probably *the lingam*, which was inserted into its place in the *sistrum already noticed.*

The existence of these indubitable proofs, of the temples having been, certainly at some period Brahmanical, cannot be ignored, any more than that of the Stupa, supposing the round basement turns out to be a Stupa.

In this case, it would absolutely compel the inference, that the Temple was at one time Buddhist, at another Brahmanical, while its material new forms a Muhammadan Masjid. What strange vissicitudes these stones have gone through !

The present North and South boundary walls, are aligned roughly East and West, there being a small error in each ; in the former of about 3' in the latter of 4½ degrees, assuming the longer axis of the Masjid to be correctly aligned in the meridian ; this however is not the case, although the error here was not accurately determined. The error of 4½° is not however an error of carelessness, but rather a deviation, *forced* on the archi-

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fect, by the existence of the tank 2; to which is also due, no doubt, the difference in the distances from the Masjid, of the North and South boundary walls.

It may however be accepted, that the architect, in setting out the long lines, did his work so carelessly, or his instruments were so defective, that he was liable to errors of about 3 degrees. Taking into consideration the care with which his levels are all set out, as well as the greater correctness of the lines of the Masjid itself, I would rather assign this error to carelessness in setting out, what he knew to be unessential parts of the great building, than to any special defects in the instruments he employed. In the Masjid Court, the difference in measurement of the two diagonals amounts to nearly 5 feet, of which a foot may be due to the unequal stretching of my own measuring tape, leaving 4 feet as the measure of the error of the architect.

The more ancient Hindu architect, also appears to have been in error, in setting out his right angle at P., (the only one now existing to check his accuracy of execution) by as much as one degree. An amount, which, though small as compared with that of his Muhammadan successor, is nevertheless according to modern requirements, too great, to be ever permitted by a modern architect.

Of the tanks which surround the Masjid inclosure, it appears to me that tanks 3 and 4 are undoubtedly Muhammadan, dug in all human probability, to furnish the earth for the bricks, of which the Masjid was built, as also tank 5; but tanks 1 and 2 are certainly Hindu, not only because the position and direction of tank 2, appears to have forced on the later Muhammadan architect, his deviation in the correct alignment of the South boundary wall; but, as regards tank 1, because, descending down this tank, was found, during the excavations, a flight of steps, built of the older Hindu brick, and set in mud; and not only were the steps alone thus found, but a fragment of the upper flooring, of the platform of the tank Chaubutra, was also found intact; furnishing thus, not only an indication of the age of this tank, but further, supplying definitely, the level of the Hindu Court, or rather of the grounds just outside the walls of the Hindu Court.

This level which nearly coincides (it is only about 1½ feet lower) with what the outer offsets of the plinth of the East wall of the Masjid (not shewn in the drawings) as well as the undisturbed surface of the ground outside at West shew to have been the original levels of the Muhammadan Court at the East end, is considerably lower than the level of the Court near the West boundary wall; whether this difference, 7 feet, is a difference which also held in the original Hindu Court, or whether a part, and if so what portion, of this difference is due to the Muhammadan Court being left, and the Masjid being built (necessarily perhaps on account of the debris of the Hindu Temple, the removal of which would have been expensive) in that part, on a higher level, at the West end, where it overlapped or overlaid rather, the foundations of the Hindu Temple, excavations can alone determine; what is known is, that the level of the floor of the East cloisters near the gargoyle, is 4′ 6″ feet lower than the level of the floor of the central nave of the Masjid, the difference of level, being to all appearance intentional, to secure efficient drainage.

The materials employed in building the Masjid, may, at the outset, be divided into stone, brick, lime, sand, clay, timber, iron, copper, glazed tiles, and colors.

The stone used is of four kinds. One, a uniform, close grained stone, full of very minute air holes, somewhat resembling laterite, but much finer grained, and of a dark grey color, approaching a dingy black: this is used in the West wall of the Masjid, both internally and externally: internally, except in the nave which is of the smooth basalt, it is used up to the springing of the arches; externally, the entire West facades with the exception of the projecting Royal Chambers, and the two posterns, which are also of the smooth basalt, is, up to a height of 11 feet throughout above plinth, as well as the entire plinth, and the foundations of all the Towers are built of this stone. Portions of the North and South outer walls, are also built of this stone, to varying heights. The stone appears to me to be of igneous origin, and not to be a real laterite; I have not been able to ascertain the quarries whence this was obtained, but as stone like it, is to be found near Maharajpur, and elsewhere in the Rajmahal Hills, I have little doubt they were obtained from the vicinity of Maharajpur; the more so, as the Ganges, at the time the Temples were built (the demolition of which supplied the Muhammadan Architect) undoubtedly ran down the numerous channels, which still branch off the North bank of the Ganges, at Sikrigali, and flowing past old Malda, and the East of ancient Gaur, re-entered what is *now* the course of the Ganges, about Godagari; (see part I report), thus furnishing, easy down-stream water carriage, certainly down to Malda; and thence probably, carried up the Mahananda, to the point opposite the Adina Masjid, where, the existence of an artificial sheet of water nearly a mile long by half mile wide, proves it to have once been a place of note; the last four miles being accomplished by land carriage (see Indian Atlas Sheets 112, 119,) it is worthy of note that a village adjacent is named Bangabari.

The second kind of stone is the ordinary granite; this occurs sparingly; chiefly in the shape of beams to support the

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floor of the Royal platform, but also in parts of some of the niches, below the King's platform, in some of the pillars, in most of the pillar bases, in the larger doorway jambs and lintels, and occasionally, elsewhere, along with the other kinds; the stone however does not appear to have all been brought from the same quarries, as the grain of the stone, varies from coarse to fine.

The third, I take to be a kind of dark grey sandstone, used chiefly in the niches which are not built wholly of brick, but occasionally also elsewhere; this is a comparatively soft stone and flakes off from the action of saltpetre.

Lastly is the fine, very close grained, blue black basalt, which is used for all the fine sculpture, for the flooring slabs of the kings' platform, for the smaller doors, for the prayer niches, for the shafts of the pillars, for the interior cornicing of the great vault, for the facing of the West wall of the vault to nearly its full height, for the whole of the external mouldings and walls, up to the platform level, of the king's chamber; for the lowest storey of the corner towers, for the pulpit and stone work in the great nave, for all the elaborate sculptures, and elsewhere; this stone is used in various degrces of fineness of chiselling, from the polished door jambs, and sculpture, both Hindu and Muhammadan, and the polished, fluted pillars, of the Royal platform, to the coarsely chiselled segmental pieces, which composed, and compose, the shafts of the ordinary pillars, fallen as well as standing.

From where stone No. 3 was obtained I cannot conjecture, as I have not seen similar stone in the Rajmahal hills any where near Sikrigalli, whence the other stone was assuredly obtained, but the stone No. 2 as well as the blue black basalt, erroneously called black marble by Francklin, were undoubtedly obtained from the quarries near Maharajpur, where they, or at least the blue black basalt, is found in abundance, and is to this day, dug out, and broken up, into railway ballast; the walls of the fortress of Terriagarhi, (which by the way should be Teliagarhi the name being obviously derived from the "Telia" stone the native name of this black basalt) are built mainly of this stone, and although the quarries now worked, yield only detached rolled boulders, imbedded in a red, ferrous, gravelly matrix, I am, in face of the large slabs, beams, pillars, door sills, and jambs, and squared blocks to be seen in the Adina Masjid, and in the walls of the Teliagarhi fortress, led to believe, that it is rather by preference, that the quarries now worked, are only those, which yield rolled detached boulders, easily broken into ballast, than because quarries, yielding larger stone, are not to be readily found, if need were.

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Naturally all these stones would be conveyed by water carriage, as detailed in the case of the stone No. 1, to the site of the works.

Not a single piece of stone of the enormous quantity used in building the great Masjid, appears however to have been quarried by the Muhammadan Architect for his Masjid; every single piece of stone there used, has been taken from a previous existing building, and no doubt from the Temple of Aditya Sena Deva, whatever it may have been, Buddhist or Brahmanical Hindu. The door jambs, and such slabs as bear on one face Hindu sculpture, (turned inwards by the Muhammadan architect, but now exposed to view by the vissicitudes to which his work has in its turn been exposed) are obviously and undeniably Hindu, but beyond these, the floor slabs, plain polished blocks, and pillar bases, are also proved Hindu by occasional masons marks in the mediœval or Gupta characters, while even in the stones rough chiselled by the Muhammadan architect, to form the shafts of his pillars, or of his corner towers, the difference of finish of the chiselling, which fits it for the place it now occupies (or occupied) in the Masjid, from the earlier Hindu much finer chiselling, whenever, as is frequently the case, any portion of such chiselling remains, shews, that even the broken and irregular fragments, used to eke out odd gaps, were plundered from older buildings.

The bricks used are of 3 kinds (1) the large 12 × 10 and 10 × 8 brick of the older or Gupta Temple, now mainly found in the West boundary wall, but occasionally also elsewhere and in broken pieces found all over the grounds. (2) The small brick, only 1½ inch thick, evidently burnt by the Muhammadan architect for his Masjid; of this brick the main body of the building is built. (3) The wedge shaped brick used only but not invariably, in the arches and domes and presumably burnt by the Muhammadans.

Besides these, are the ornamental bricks, these are of varying sizes, to suit the patterns, and seem to have been stamped and burnt on purpose, for the ornamental work; but the whole of the ornamental work, is not made of this brick, only portions, which will be detailed in their proper place.

All these bricks, are made of clay, finely tempered, remarkably free from grit, and although there is unmistakeable evidence of their having been ground moulded, the edges are sharp and square, and one surface at least smooth. The slightly varying thickness of bricks, of the same size in length and breadth, leads me to the inference that the moulds used, were of wood, and not iron faced, and that the variation is thickness in due to the gradual wearing away of the moulds.

The burning was no doubt done with wood for fuel; the bricks are almost all under-burnt; few and rare are the pieces of vitrified brick to be seen in this vast building; but though under-burnt (that is the heat carried to a point to burn the bricks to an orange red in general, and in many instances to a yellowish orange and not to the harder purple) the burning has been carried quite far enough, to render the bricks proof against the weather; while, whether due to the stiffness of the clay, or to the under-burning, or as may more reasonably be concluded, to both; the bricks possess a toughness, which the modern highly burnt brick does not possess.

Naturally with a stiff clay containing little admixture of sand, the drying and burning would be a very delicate operation, to avoid splitting; and the under-burning is therefore not a defect due to the use of wood fuel, (and of that even, according to modern practice, an insufficinat quantity) but rather an excellence, intentionally and deliberately aimed at by the architect, and in great measure successfully attained. The excellence consists in this, that the moderate firing which has been employed, has enabled the architect to use a clay so stiff, with such small admixture of sand, as would have been impossible to use with a more violent and thorough burning; with the result, that (1) the bricks are not too hard to cut into ornamental work wherever necessary, (2) that the bricks containing almost no sand, are highly compact and non absorbent; resisting, far more effectually that the highly sanded brick, which the modern system of high firing compels modern builders to use, the slow destruction from absorption of, and subsequent crystallization of, saltpetre; (3) that the khoa from these bricks, when mixed with the proper proportions of lime and sand, is more effectually consolidated in the ordinary Indian process of beaten terracing, into a solid mass of impervious surface; which, as may be seen in almost any part of the ruins here, holds together and behaves as a homogenous solid; supporting itself, in sheets and slabs of great size, when the supporting arch, beam, (or other support) has fallen.

The only disadvantage attendant on the moderate burning is the less capacity of the brick to crushing, but as will be seen, the maximum crushing force to which it is subjected is so small, that, used as it is, this disadvantage is nullified.

The lime employed appears to be the ordinary nodular lime obtained from Kankar containing about 30 per cent. of foreign matter chiefly alumina. Kankar is obtainable in unlimited quantities near Rajmahal, and all the way along the Ganges, but it appears that the Kankar used in the building was obtained from Sahebganj, where even now, it is obtainable more easily and

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cheaply, than in any other place equally well situated with regard to the Masjid, in respect of carriage. I am not aware of any quarries whence Kankar could be obtained nearer to Adina, I have heard vague rumours that it is obtainable at Gajol on the Dinajpur Road and at Dingra on the Mahanda; but when it was in contemplation to conserve this building, (I being the engineer in charge,) I failed in procuring any from these places, and was obliged to contemplate bringing it from Sahebganj during the rains, when alone *in these days.* it is possible for boats to come down with the current to Malda, the remainder of the distance being partly up stream by boat, and the last 4 miles by land carriage.

There are quarries of a variety of lime stone at Patharghatta, near Kahalgaon, but from the remains of fragments of the unburnt lime stone, in the concrete used in the building, it does not appear to have been used in this Masjid, at least as a cementing material. It is however probable, (but on this point I would not like to give a decided opinion not having subjected the material to rough analysis) that the fine coat of lime smoothing, on which is cut the beautiful interior ornamentation of the spandrils, and jambs of arches; and the interior surfaces of the domes; was in this finer and purer lime. If so the Patharghatta quarries, where alone it is obtainable, must have been used to obtain it.

The sand used is rather fine grained, with only a slight yellow tinge, I believe it to have been obtained from the upper reaches of the Mahananda near Barsoi and Dingra, where, in making arrangements for the contemplated (but never carried out) conservation, I ascertained such sand to be obtainable in abundance in the river bed. Of course water carriage would be available the whole way except the last 4 miles.

The sand is used mixed with lime as mortar. Wherever a fine mortar was needed, this was used, the lime (omitting its impurities in combined clay) being in the proportion of one to one in the mixture. Of clay and sand, as the Kankar of which the lime was made itself contained 30 per cent. of clay and foreign matter, it is evident, that the proportions practically used in the mixing of the mortar, that is equal parts of lime and sand, gave in reality, a mortar, wherein 75 per cent. (as analysis shews) of foreign matter to 25 per cent. of real lime prevailed.

But where thick joints occur, especially in the rubble stone masonry, the mortar appears to have been mixed, with varying proportions of pounded brick; the brick however was not pounded fine, as in the modern Surkhi now universally used in India, but rather coarsely crushed into a sort of grit, of ¼ inch to ½ inch sized fragments.

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In the concrete however for roofs and floors, and in all places where beaten concrete is used, as in the covering coats of parapets, cornices, &c., a much larger proportion of broken brick, and these again of a much larger size, was used ; but the concrete not having been subjected to rough analysis the proportions used cannot be accurately defined.

Clay is used as cementing material only in the West boundary wall and in almost no other portion of the Masjid ; but the later buildings, tombs, walls, &c., built subsequently (and being built on the fallen rubbish of the Masjid, obviously dating to the period subsequent to the neglect and decay of the Masjid) to the partial ruin of the Masjid, were during the excavations, found to have been built of brick and mud ; notably was this the case with the so-called tomb of Sikandar Shah, the founder of the Masjid, which was not only built of *broken brick* and *mud* ; plastered over, but was actually found built on the debris of the fallen domes of the chamber wherein the tomb stood.

Glazed tiles, colored yellow, blue, green, red, purple, and black ; were used, but used sparingly in the Masjid ; the blue is rather a bluish green ; the yellow appears to have been of two shades, a pure light yellow, and a buff ; the purple is a dark purple ; the red appears to have been of two shades ; as also the black, though this may be rather due to the weather toning down the darker black to a dark ash.

The glazed tiles had the patterns, inscriptions, or flowers, as the case may be, drawn and colored on them before burning in., the patterns are not obtained, as in some instances in Gaur, and elsewhere, by the arrangement in patterns of uniformly colored tiles, cut or moulded to shape, to fit the patterns, but apparently by first laying out the needful tiles, and drawing the pattern or inscription on them in the proper colors, and then burning the colors in. What the material of the colored glaze and the colors are, I am unable to state.

Apart from these colored glazed tile decoration, there is proof of color having been used in the interior decoration in two ways :—

(1). A water color used in painting the interiors of domes, and perhaps elsewhere, over plastered and lime smoothed surfaces ; the only existing colors of this class, are, a dark red, (red ochre) a purple, a black, and a yellow.

(2). A thickish coat, laid perhaps on the relief surfaces, and certainly within the recessed surfaces, of the sculptured stone work.

In this last work the colors used, of which traces still exist, appear to have been a bright green, a blue, a purple, a vermillion, a dark red, a yellow; there may have been others which have left no traces.

As may be inferred, the traces left of these colors, are exclusively in the recessed surfaces; and even here only in sheltered corners.

The colors were laid on of an appreciable thinkness, so far as may be estimated from the scanty remains, and of about the thickness of ordinary stout drawing paper.

The green is verdigris; the blue ground ultramarine of a cheap and inferior quality, still common in the Indian Bazars; the bright red, is vermillion; the dark red probably iron, or the common red ochre of the country; what the yellow and the purple were made of, has not been ascertained.

Timber was used certainly for the doors. Though none are now left; the socket holes for the door pins to work in, are of a size to prove that the projecting pins, on which the doors were pivoted, to work in the sockets, were of wood, and probably in one piece with the door: judging from these socket holes, the doors, if of planks or battens, or the frame work of the doors, if they were framed and panelled, were two to two and half inches in thickness.

Judging from the holes yet existing to receive the sliding bars, by which the doors were shut, these bars also appear to have been of wood.

But the most curious use of timber appears to have been in the roofing: strange as it may appear, while there is no room for supposing, that a single piece of timber, was used in the entire vast building as a *beam*, there is the most irrefragible proof of timber having been used as a *wall plate*, for *the main vault to spring from.*

Broken and dismantled though it is, enough of the lowest portions of the vault remains to shew, that it sprang from a rectangular beam about 12 × 10 inches laid in a channel in the masonry in which it was imbedded. The wood has decayed and disappeared long ago, but the empty channel near the springing (with in places a crumbling woody powder now in it) as well as the hole into which the beam end was inserted in the inner face of the West wall of the nave (see plate 94) still exists.

What the wood was which was used in the Masjid, is more difficult to ascertain; as the Masjid was built in A. D. 1307 and as in those days the use of immature sal timber (now so common and due to the exhaustion of mature sal to supply railway demands) had presumably not been necessitated, the timber, had it been sal, would scarcely have now totally disappeared; instances being common, of sal, lasting more than 580 years; nor could it

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have been teak, which judging from the Western caves, is of even longer duration ; I infer consequently, that some local wood, more easily rotted or attacked by white ants, was used, and probably played no unimportant part in the downfall of the vault.

Iron was occasionally used in binding together with cramps, the stones which were used to build the pillars, but its use in this position as also elsewhere in the shape of cramps was not profuse ; it was however largely used, manufactured into coarse long linked chains.

No less than 3½ maunds of fragments of such chains, in the shape of broken links and rings were found in the debris during the excavations undertaken 4 years ago, and I infer, that the links picked up, are the broken links of chains, which were hung from the crowns of the domes to bear lamps.

Every dome had not a chain, but whether only one, or more than one dome, in each aisle, had a chain it is of course now impossible to guess ; I rather think one dome in each Western aisle, and one dome in each file of the cells, had a chain hanging from its crown with a lamp at its end.

The lamps appear to have been of both iron and of copper, as curved pieces of both iron and copper which can be regarded only as fragments of lamps, have been picked up in the debris. No other use of copper in the building appears to have been made.

These materials are all that are used in the building ; there is however, or rather was, one solitary specimen of "gold stone" inserted in the back wall of the Masjid high up, with the fish symbol and the "Bismallah ul rahman ul rahim" sculptured thereon in relief ; this stone which I saw and touched in situ in 1883 is now however gone.

The materials above described, are all used in the Masjid, in its various parts as already detailed, and the quality of the work executed, depending partly on the material and partly on their mode of use, naturally varies greatly.

The main work as may be conjectured is masonry of brick and of stone.

The stone masonry so far as can be judged from the portions of interior work displayed by ruinous portions, appears to be very inferior. There is, where stone alone is used, a facing of carefully cut and fitted ashlar work, with joints as fine (perhaps finer) as the best ashlar masonry of the present day ; but this exquisitely surfaced ashlar work, hides work of the most perfunctory character ; behind this beautiful face work, comes a mass of rough rubble masonry, built of boulders and fragments of all shapes and sizes : not only in the thick walls, but even in the

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slender pillars, has this sort of work been permitted; boulders and fragments, smooth rounded, or rough and angular, are, to all appearance, thrown in without the slightest regard to bond, and the gaps filled in with a concrete.

The procedure, as disclosed by the broken parts, appears to have been to build; in the case of walls, the two faces, in the case of pillars the smooth round outer shell, of stone carefully cut, and set in a fine mortar of lime and sand; the courses being alternately, of stones laid with their largest dimensions horizontal, and of stone with their longest dimensions vertical; when the outer fine shell had been carefully fitted, the space within appears to have had a concrete of fine brick gravel and mortar, thrown in by the basket load, into which rough stone, without any regard to bond, was then imbedded, so as approximately to fill the core; and more mortar then laid on plentifully and gronted into the joints, bringing the inner core roughly, and roughly only, to the same level as the top of the course of outer fine ashlar work; then a second layer of ashlar stone, but this time a mere veneer, that is the stones with their longest dimensions vertical, were carefully fitted and set in fine mortar as before, and the hollow core filled in, precisely as in the case of the previous horizontally laid course; naturally the strength of the wall, (or pillar) was, with this mode of construction, not the strength of the ashlar facing outside, but of the rubble core inside.

The brick work is rather better built. Mainly because the material being small, it was not easy in arranging the brick, to leave such large gaps as with rubble stone, but nevertheless the work is not what the much maligned modern Indian Public Works Department, would for an instant permit: here as in the stone work, the face work is built of brick carefully set, and even more carefully, surface smoothed; but behind this outer, fine, but thin facing, the bricks are set with no regard whatever to joint or bond; while every piece apparently, which the masons found within reach, broken, vitrified, under burnt, or good, was indiscriminately and impartially put in: the excellence of the mortar, has however welded the core, and the fine facing, into a solid mass in most places; nevertheless the facing does occasionally flake off, or bulge out, as may be seen in plate 89. It is clear here that however caused, the outer fine shell has separated, (flaked off more correctly describes the case) from the rough inner core.

The joints in the face work, are as fine as in fairly good modern brickwork of the present Indian Public Works, occasionally finer; but in the core, joints over an inch thick, are common, and more especially in the vertical joints, where indeed it is the rule rather than the exception.

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The work in the arches is however much more carefully executed; the arch rings are from 15 to 22 inches in aggregate thickness, varying according to sizes of the arches; the joints are fine, and great care has been taken, both as regards the radial joints, and the cross bonding. The only fault which can be found with the arches is in the keystone; naturally with lancet shaped arches, and radial joints, there will be left a great triangular space at the crown; this has not been filled in with such care as it might have been, but appears in every case to have been rather rudely filled in solid, without any particular care as to the direction of the joints: the mortar and the rest of the arch work however, is so good, that even where, as has happened in the great majority of arches, the key bricks have partially decayed, or fallen out, the arch nevertheless stands safe.

Among other places where also special care has been taken with the brick work, are the corbelled pendentives; here the courses are carefully bonded into the backing, and though, as may be seen from the plates, the pendentives are of the simplest description of mere corbelled out work, they have supported and still support the domes above.

The brick work of the domes, (they are all of brick) is also carefully executed in the interior surface of the dome, but outside this, the bricks are set without any regard, to bond or fineness of joints, though the radial direction of the joints is roughly preserved to some extent; the exterior surface of the brick work of the domes, which are altogether 13 inches thick, wherever laid bare by the destruction of the plaster, shews exceedingly rough work; but a dome once built with its one innermost hemispherical shell carefully arranged, is so safe, that almost any amount of rough work can be indulged in in the outer layers. It needs to be added, that, a thick layer of beaten concrete, (10 inches thick) effectually prevents any access of water to the rough and rather loose brick work of the outer layers of the domes, and prevents leakage.

The brick work in the cornicing, is also exceptionally good, and indeed, seeing that the main cornice projects no less than 12 inches from the face of the wall and is wholly composed of ordinary small bricks, it was simply imperative, to put in here, the best quality of material, as well as the greatest care in execution.

In the ornamental panelling or rather filling of the lancet shaped space, between the springing line of the arches and the arches, as well as in the various brick niches and panelled ornaments, the face work is very carefully executed, but the backing is, as in the case of the walls,, rough work. The bricks of the ornamental work are of varying sizes to suit the particular requirements in each case or class of work; they are in many instances, merely a vertical veneer, the bricks being stuck on with the larger dimensions vertical, to a thick backing of mortar: in a few cases where the pattern admits of it, the vertically stuck on bricks atternate with bricks laid horizontally, whose *ends* are cut into and also in some cases were moulded into ornamental patterns: in the panels and cornices both varieties of work are to be seen.

For a detailed statement of the employment of these ornamental bricks in the panelling and ornamental work in corbels, freizes, cornices, &c., see appendix I.

The brick lattice work is also carefully executed.

But in all other places, not being face work and not specially mentioned, the work is very coarse and careless; thick joints, absence of bond, and indiscrimate use of bricks of all sizes and qualities, so as to fill the given space, are the characteristics.

The brick work appears in every case to have been covered with a layer of plaster, or concrete, or lime smoothing and I could not, (and here Babu Raj Mohan Banerjya the draftsman, who in measuring the building in minute detail has necessarily scrutinised it even more carefully than me, agrees with me) find a single instance in the entire building, where the naked brick surface was exposed. The covering coat, as regards domes and roofing, is a layer, varying from 8inches to 20 inches. (10 inches over domes 8 inches to 20 inches over flat roofs and of 8 inches to 12 inches over floors) of beaten concrete, with a thin layer $\frac{1}{2}$ inch of beaten fine plaster on top smoothed down.

The bases of the foliated caps were also of concrete; what the caps themselves were made of, as none exist, it is now impossible to ascertain.

As regards flooring, the brick work was covered by a layer of beaten concrete, about 12 inches thick, overlaid by a fine surkhi coating about $\frac{3}{4}$ inch thick with just a thin layer $\frac{1}{4}$ inch of lime smoothing beaten on and smoothed. The surfaces of walls where plain, whether of stone or brick (except polished stone) appear to have had interiorly a coat of $\frac{1}{8}$ inch of lime (not lime and sand) smoothing, while exteriorly, I have, from the few traces that exist, come to conclude, that not only the brick work, but the whole of the stone work, except the fine, almost polished basalt work, had a coat of nearly $\frac{1}{2}$ inch of lime and sand plaster laid on and smoothed off, with an extra $\frac{1}{4}$ inch coat of fine lime smoothing (without the sand) in the mouldings, cusped arches and other ornamental parts.

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The fine basalt work outside, where plain, (I suspect, but am unable to prove by remains) had a thin coat of fine lime smoothing only, laid on; the only places where they occur, are in the corner towers, and the *basement* and basement only, of the King's Chamber; and the exceptional and violently contrasting and incogruous appearance of these isolated pieces, if left naked, as against the whole of the rest of the outer (and inner too) surface, compels me to suppose, in the absence of positive evidence to the contrary, and in order not to convict the architect of inconsistency, that they were also covered with a fine coat of lime smoothing, now naturally wholly peeled off the smooth surface, and washed away by the rain of 700 years.

The cornicing and friezes, and other ornamental brick work interior and exterior, which were not of colored glazed tile work, had a coat of fine lime smoothing, (without sand) laid on; the coat for the work in the interior, appears to have been nowhere above ¼ inch thick but in the exterior, there is evidence in places of a thicker coat, while as regards the ornamental spandril filling of the interior, it will be seen from plates 99 and 100; that over the layer of beaten plaster, itself ½ inch thick, covered with fine smoothing, came a further layer, fully half an inch thick of lime and sand with a surfacing of fine lime smoothing, in which the ornamental scroll work and patterns were cut. The peeling off of portions of this coat, leaving *absolutely no mark, as* will be seen in plates 99 and 100, proves, that this was a distinct and separate coat, laid on after the general coating of plaster to the building had been finished; and *incidentally it proves* that the absence *now* of ornamental work in parts, which *as now seen* look bald, and in painful juxtaposition with highly ornamental work, is no proof, that, where the æsthetic conditions demanded it, such necessary ornament in plaster, (which has wholly peeled off leaving no trace,) did not exist.

The most irrefragable evidence (in the shape of actual remains in sheltered corners) exists, to prove, that the pillars of basalt, in every case, except the polished fluted pillars in the King's platform, had a *thin* coat ⅛ inch thick of lime smoothing laid on, and possibly colored; this was really necessary, as every pillar in the Masjid, without exception, outside those on the King's platform is a built one, that is to say built of segmental pieces of basalt chiselled to shape, of irregular pieces, and of very varying degrees of fineness; and neither the joints, nor the sizes of the pieces, nor their execution, are so uniform, as to justify the exposure of their naked, unequally smoothed surfaces, and irregular sizes and setting. I believe the fluted polished pillars in the King's Chamber to have also had a very thin (about as thick as ordinary drawing paper) coat of color, in ornamental patterns, wholly or partially laid on, so as to match the undoubtedly gorgeously colored adjacent prayer niches, but the case of these pillars is so purely exceptional, that here, and here alone, I am able to admit the possibility of the polished monolithic pillar surfaces having been left naked; although as a matter of pure opinion, without any proof, I rather think they were not left naked.

The highly sculptured work in the prayer niches and in the pulpit and elsewhere, have to this day traces of color in sheltered corners, while the cut brick work inside, and the lattice work, still shew remains of the ¼ inch coat of lime smoothing which once covered them.

The interiors of the domes were plastered and colored, and the ornamental bands at the springing, as well as the cut flower work occasionally in the crowns, and the bosses in the spandrils of the arches in the interior, where not of stone, were all of plaster, laid on over the general coat of plaster, then cut to the needful patterns, and carefully smoothed over with a fine lime smoothing.

The tops of parapets, battlements, cornices; all surfaces which rain could beat on vertically, were not only plastered, but had a layer of beaten concrete laid on before the plaster, as also all water channels.

I believe also, that the boundary walls, Muhammadan as well as pre-Muhammadan, were plastered, but as no where is any portion intact left; it is difficult to venture an opinion on its thickness; all that can be said is, that, as the mud-set old Hindu wall, would have crumbled down if unplastered, and as it certainly did not so crumble down, while the Masjid was kept in good order, (since remains of it exist to this day) it must have been protected with plaster.

The old Hindu ghat leading down into tank No. I—(Index plate) had its floors and steps of brick set in mud, protected by beaten concrete, with lime smoothing on the surface. The concrete shewed no traces of lime, it appeared to be simply broken brick, well beaten into a solid compact mass, whose upper surface had a protecting layer of hard lime smoothing, ¼ to ½ inch thick laid on. This I need hardly add is old Hindu work: the use of fine lime smoothing in Hindu work is seen at a very early period, certainly as early as the 1st century A. D., though the of use lime, as a mortar, mixed with sand or surkhi, to bed bricks into, and fill in joints, is not seen (that I can now recall) in any building dating to the pre Muhammadan period.

With the above mentioned materials to build his Masjid, the architect was necessarily constrained to suit his design to the material. It has been said already, that there is no evidence, of a single stone having been quarried, for the purpose of being used in the *Masjid*. The quantity of stone of sorts, used in the construction, may in round numbers be set down at a lakh cubic feet, while the total quantity of masonry in the building, is, in round numbers, 10·0 lakhs cubic feet; it will be thus seen, that stone forms but a fraction of the total, $\frac{1}{10}$ being stone, and the rest brick, and brick concrete, above floor level.

Add to this, that all the stone is used, in the lower courses, in the pillars, and in the ornamented interior prayer niches, besides what is used as doors, beams, and in the platform of the King's floor; and it will be evident, that practically, the Masjid had to be designed as if for brick, and not for stone as the building material.

The building is however composite in design. As will be shewn further on, the area of the points of support bears a proportion of only a fourteenth to the area roofed over, a proportion far too small for ordinary Indian brick architecture; but to judge from this proportion alone, would be illusory, as the apparent lightness, is obtained, mainly because the building may be said, to be almost built on pillars, which by the way are of stone; but even so, the lightness is obtained at the sacrifice of stability. As will also be shewn further on, the destruction of the Masjid, must be mainly attributed to this lightness of construction.

The pillars, a principal feature in the interior of the building, are designed for stone; they are far too slender for brick; but even so, the architect does not appear to me to have made that allowance, which was necessary for safety, on account of the *mode of construction* of his pillars, (built of stones alternately laid flat and on edge and the core filled in with irregular rubble work.) To the casual visitor, the pillars appear sufficient to do their work, yet gracefully light, and well proportioned; but the engineer, who has seen the mode of construction as disclosed by broken pillars, will not feel surprised, that out of 254 tall, graceful, single shafts, built as above, (not 260 as Franklin says) but 16 now exist intact. I do not include the 18 double (superposed) pillars, in what is known as the King's platform, which are in their upper part monolithic, and in their lower exceedingly massive, and built it appears to me, without the courses being laid alternate, on their beds and on their edges: only the upper half of one of these substantial ones has gone, and that a corner plaster, which as will be seen from plates is thinner than the pillars. When the counter thrust of the arches which abutted against it on the East and North sides was removed by

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their destruction, it naturally could not resist the thrust of the arches pushing it from its South and West faces.

Of the other portions, obviously designed for stone, the most prominent and important, as well as graceful object, is the pulpit; the proportions of its parts, are too slender to be suited for brick work, it bears little internal or external stress and strain, has stood fairly well, and but for the falling in of the vault, whose fall destroyed the roof and the handrail, and injured some other parts, it might have stood, a thing of beauty, for an indefinite period. Wanton destruction has however assailed it, no doubt from European hands, for the purpose of carrying off the exquisitely sculptured steps, leading up to the upper platform.

I say from European hands, because none of the poorer Muhammadans or Hindus would have dared to wilfully destroy it, through respect, or fear, or both; for as I have said before, the place is sacred, as a pilgrimage, to Hindus and Muhammadans alike: nor can I regard the Nawabs of Murshidabad (by whose orders the Gaur buildings were dismantled, to furnish stone and brick for their palace in Murshidabad) as having had a hand in its destruction, as the building stands, luckily, too far from water carriage, with no easy roads to facilitate conveyance of the exceedingly heavy stones. If *they* had destroyed it, there is absolutely no reason, why, they should have contented themselves with 2 or 3 stones only, of the pulpit, when they might have carried off the whole, as they did in regard to the light flooring slabs of polished black basalt, from the King's platform. It is the European alone, who, actuated by a desire to present specimens to museums, or carry them off as souvenirs, would remove 2 or 3 only of the stones: it is a shame that those who may be regarded as enlightened, thould commit a barbarous vandalism, surpassing the vandalism of the much abused Bengali, but the thing has been done, and no useful purpose can be served by attempting vainly to shift the burden to other shoulders; while some good may result by exposing the vandalism, practised by men who ought to know better, by the enlistment of public opinion against such acts of wanton barbarism.

The vandalism, greatly to be regretted as it is, has however disclosed one most important fact; it has disclosed the buried great pedestal, of what must have been a life size statue, within the core of the pulpit. The importance of this discovery lies, in the proof it furnishes, of the sanctum of the destroyed Temple, being originally here or hereabouts; as not only does the pedestal fill the core of the pulpit stairs, but the superb canopy of the great statue, and the pillars and pilasters of the doorway leading into the Temple, now form (modified slightly, but un-

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mistakeable nevertheless) the main prayer niche, and its surrounding ornamental pillars and lintels. It is not necessary to specify the pieces, any one can identify the pieces, and the original purposes which the pieces subserved, by looking at the Photograph plates.

I have called the structure a pulpit, in deference to current accepted (among Europeans) opinion; but I have already shewn, in a previous report, from the example at Kalna, that the corresponding shrine there, could never have been used as a pulpit; while in support of my newly formed idea, the purpose assigned to these, and similar shrines elsewhere in Bengal, by the people of Bengal, is, not that they served as pulpits, but that they inshrined the effigy of the tomb of the Saint Husain. In short, here rested the symbol, till it was wanted for the Muharram procession; and surely the people, whose ancestors built and worshipped therein, and who themselves occasionally worship therein, may be allowed to know the uses of the various parts, a little better than foreigners, who do not worship therein, and who, whatever they may know of the life of Muhammad, or of Hasan and Husein, are necessarily ignorant of the details, of what, for want of a more appropriate name I must call the liturgy of a religion they never professed.

While on the subject of miscalled objects it may be as well to say also, in regard to what has generally in this Masjid, been called the King's platform, that it is not the King's platform, but a Ladies' platform; not only are corresponding raised platforms, with their separate special entrances, in all the other Masjids in Gaur, admitted to be Ladies' platforms; but, in this particular one, the fact of my having actually found pieces of the fish scale and quatre-foil pattern stone lattice-work, in the debris just under the edges of the platform, goes to prove, even if no other traces of their use existed, (and they do exist) that lattice screens, certainly of the fish scale and quatre-foil patterns, and possibly of other patterns, were used; while the existence of a sloping stone ramp, in the open vestibule to the East of the so called King's chamber, (V. in index plate) seen in section in plates I and 24 proves, that the chamber V. and the platform alluded to, in the Masjid, are not King's chamber and King's platform, but the Zenana portion: for the sloping stone ramp, could not be meant to allow the king to get up to the level of the chamber on horse back, as the horses hoofs would slip on the sloping stone pavement; and no elephant could come in at the door; but the sloping ramp would be needed, and would be just the suitable means, for allowing Palkis and Dulis, to be brought up to the door of the Chamber V. while further corroboration is given

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by the close proximity of a covered, and screened privy. (See C. in index plate.) I will accordingly henceforward, designate the raised platform in the Masjid as the Ladies' platform, the chamber V. as the Ladies' chamber, and its attached open vestibule to the East, the Ladies' vestibule; and possibly, though this is only speculation, the portion of original Hindu double wall at P., left unbroken by the Muhammadan architect, was so left to form one boundary, of what may be considered the Ladies' Court.

It must be understood in speaking of the pulpit and the raised platforms, that I confine my remarks to Bengal alone; so called pulpits and raised platforms, occur elsewhere in India, and I have seen them; but in those days, I did not inquire into the uses, of what I thought I knew the uses of already; as I was too conceited to think that a (compared with me, ignorant) native of India, could know more than I had learnt; completely losing sight of the circumstances, that in the first place, my supposed knowledge was picked up from the rather loose writings of European foreigners; and that in the second place, a native, though comparatively ignorant, in almost all other matters, would be immeasurably more likely to know the correct uses of objects used in his own Masjid or Temple, than any foreigner, alien in race, as well as in religion.

The various prayer niches, appear also designed for stone; and well indeed has the architect utilised the Hindu material he found available; see photographs. Although the portions, not found to be suitably ready fitted, among the Hindu monolithic remnants, are built in the usual Muhammadan style, of alternate courses laid flat and on edge; yet, as they really bear but little weight, and are subjected to no internal stresses, they have lasted intact in every case, to this day. The door frames are simply the Hindu door frames, originally designed for, and executed with marvellous patience and skill, in an exceedingly hard basalt, (there are some plainer ones also in granite) and simply utilised where needed, by the Muhammadan architect, after carefully chipping off the figures, over the centre of the top lintel, and the figures supporting the side lintels; but utilised, not inappropriately. The environments of the doors, where used, are in all cases carefully suited to them, as may be seen in plates.

In fact, the architect has designed each doorway, with a special view to the old door frame he was employing; the material he had in hand, has, in the cases of the prayer niches, as well as of the doors, exercised a preponderating influence on the design.

The basement mouldings of the Masjid on its West facade or back wall, appear to me, also, to be specially designed for stone; indeed, I consider that these mouldings, are pre Muhammadan, and that the Muhammadan architect, has simply utilised, the ready made basement mouldings of the temples he destroyed. A comparison of the mouldings in stone marked M. in plates 1, 8, 9, 22 with the corresponding mouldings (in brick however) marked M.′ M.″ in plates 1 and 2, will shew at once, the difference in spirit, between the latter, (which as being in brick are necessarily Muhammadan,) and the former. As the mouldings M. in stone have a maximum projection of 4½ inches, (the brick ones have a projection of 3½ Inches) it is clear, that there could be no constructive difficulty in making the mouldings in brick, similar to those in stone; but the architect appears to have used the one sort, exclusively in the stone built part, and the other in the brick built part.

The special features, apart from the difference in the forms of curves and arrangement of surfaces, to which I wish to invite special attention, are the plain septa marked, S. in the mouldings marked M.in plates 1, 8, 9, 22. These septa, are a peculiarly Buddhist feature, and what is more, are only, exclusively seen, in Buddhist, and in the older examples, of Hindu architecture.

Some great critic of Indian Art and architecture, (I cannot now lay my hands on the exact book chapter and page I would feel thankful to any one with a better memory than I have to give the reference but I rather think it is Fergusson), has propounded a theory, that the septa, are due to the distrust of the earlier architects. The writer goes on to point out, how these septa, originally left solid, came to be hollowed, (bored through behind) so as to carry the retired lines of mouldings through, leaving the surface of the septa unbroken, till finally, practice gave confidence, and the architects dared to cut it through; the modern representatives of these septa, being the little triangular, or other ornamental turned up little excrescences, which occur at intervals, on all later Indian mouldings; the theory is a plausible one, and I could score an easy assent to my statement, that the mouldings in this Adina Masjid, by reason of possessing these septa yet unhollowed through, must belong to a very ancient Hindu building; but I cannot avail myself of this theory as I utterly disagree with it: with all deference to the adverse opinion of the learned critic, I would point out, that men who could build finely balanced Sikharas a hundred feet high would scarcely feel diffident as to the capabilities of stone, to bear shallow cutting into. On the contrary, I maintain, that these septa in the basement mouldings are the remains of the

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conventional method of representing the Buddhist railing. Numerous sculptures, have shewn, that the representation of the Buddhist railing, had become conventionalised, and so ingrained by custom, as a time honored ornament, that it was represented on all sorts of occasions; nay, so far had the habit gone, that false railings, not standing free, but *attached* to walls, had come to be represented on topes and on other buildings, which really had no railings round them: in short from a conventional sculptural representation of a real thing, it passed to the stage, of a habitual, conventional ornament; and when the real purpose of the thing had become forgotten, or obsolete, the thing continued to the represented, in forgetfulness of its real origin, in its conventional form, on the basements of the earlier temples, even of non-Buddhist ones. These septa are in short, conventional reminiscences, and direct descendants, of the vertical pillars of the usual Buddhist railing; while the mouldings between them represent the bars. I invite particular attention to pl. LIV. Vol II. Rajendras Orissa, where 3 sculptured relief heads, on the vertical septa, obviously and unmistakeably represent the 3 bosses or sculptured medallions, common to the upright pillars of the real Buddhist railing.

It is therefore that I say, that these mouldings, differ, not merely in the variable forms of curves, and in relief, from the brick mouldings alluded to, but *in spirit*: they essentially belong to an age, just following, or contemporary with, later Buddhism; examples of their occurrence are to be seen on temples, down to the 7th or 8th centuries, so far as I can now recall to mind, and never later, except in Orissa. I have laboriously compared them with the mouldings, from a collection of over a thousand photographs, of buildings in Northern India, in my personal possession, and can only find them in the earlier ones.

Among easily accessible published books I would invite a comparison of these mouldings with plate XI Vol. IX Archeological reports; where, though the moulding is partly buried, the septum is quite distinct, on the right hand basement of the temple, in which the double animal capitals, sufficiently attest its early age.

Specimens of this septum running through the mouldings, in various stages of perfection and on temples of various ages, may be seen also, to quote only a few out of many examples, in Vol. XVII pl. 16, 23 Archeological reports pl. XLIV. Vol. I Archeological Survey Southern India, Raja Rajendra Lala's Orissa Vols. I. II. plates III, IV, V, XXXII and XXXII, XLIV, XLV, LIV, LV and LVI respectively, while for an excellent specimen

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of the absolutely unmodified, Buddhist rail ornament, as applied to temple architecture, at the base, in place of mouldings, may be consulted the folio plate in Fergusson's illustrations of Rock-cut Temples, which shews the exterior of the great Kanheri cave. Unfortunately I possess only an incomplete set of the very expensive West of India Archeological reports, and cannot therefore refer to them; the drawings in Fergusson and Burges's Cave Temples are too small to be distinct.

I am aware that in Orissa some of the temples cited in the illustrations, date to the 9th century; but it must not be forgotten; (1), that superb Buddhist Temples, continued to be built there down to a late period; (2) that the later temples standing along side of, or in the courts of older ones, necessarily adopted the ornamental features, more or less, of pre-existing older examples.

In connection with this, my conviction, of the *survival of forms, once used with a conscious purpose, even when all consciousness of their purpose and origin have been forgotten,* I cannot do better, that, at the risk of laying myself open to the charge of "padding" my report, quote my learned and honored friend, Raja Rajenda Lall Mittra, in his Orissa Vol. I p. 22: I have felt and may yet occasionally feel myself compelled to differ from him on various points, but I am wholly at one with him, in the following, most pertinent, and carefully thought out opinions.

"To controvert these documentary proofs and arguments, the only fact of any moment that has yet been advanced is that Indian stone architecture in the first and second centuries before Christ shows evident signs of a transition from wood to stone, which could not have been the case had it existed and flourished from many centuries before it. It may at once be conceded that the caves of Behar and of the Western Ghats bear indications of their having been formed after wooden models. The same is, however, not the case with the excavations in Orissa. Were it otherwise, still the fact would not, we contend, necessarily imply that those caves indicate the first stage of transition from wood to stone. It is not to be denied that masonry houses must have followed huts and wooden structures, and the peculiarities of the latter must necessarily, therefore, be traceable in the former; but those peculiarities do not, by themselves, suffice to indicate the exact age, when the transition from wood to stone first took place. There is a spirit of conservatism, a mannerism, or a survival of custom, in architectural ornamentation so strong that it preserves intact forms long after the lapse of the exigencies which first lead to their production. Many peculiarities in European architecture, even of this century, such as the Grecian triglyphs

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and mutules, avowedly the counterparts of wooden models, may be ascribed to this cause; and in India such indications may be met with without number both in Hindu and in Muhammadan edifices of the last two centuries. In the fort at Agra may be seen, by the sides of the marble hall of Dewan Khas, two small pavilions of white marble with curvilinear roofs formed entirely after the model of thatched huts.

"They are repeated in the palace of Shah Jehan, at Delhi, and likewise at Futtehpur-Sikri and other Muhammadan cites. Slightly modified they may be seen also on the palace at Bharatpur, and on other Hindu buildings. Until the end of the last century, a common form of temple for Kali in Bengal was a quadrangular oblong room with two sloping curvilinear roofs, with gable ends in exact imitation of the commonest kind of hut known in the country. One of the kind still exists in Calcutta, close by the Nabaratna in Sobhabazar, and we have seen several at Chandernagar and elsewhere. Such structures bear the same name, *banglá,* which is given to the huts of which they are counterparts, and in their details, leave out nothing which can be easily imitated in brick, or stucco. Few, however, we fancy, would venture to appeal to them as evidences of a recent transition from wood to brick in Agra, Delhi, or Bengal.

"Mr. Furgusson is startled to find at Bijapur some fifteen centuries after the Christian era, "a recurrence to the same principle. The balconies with their hoods, and the brackets which support these, are the principal ornaments in the four faces of this little monument" (*Mehtari Mahal*). "Yet every part of their construction, every detail of their ornament, is evidently copied from a wooden original. We find the same balconies used at the present day; and in any city between Benares and Boorhanpur similar objects might be found with almost identical details, but always constructed in wood. From the remains of the Hindu temples we know that stone architecture did exist in the Deccan for centuries before Bijapur was founded." To account for this anomaly the learned author continues: "It is clear however, that the Moslims could have had very little experience in building in stone when this work was undertaken, and as little knowledge of their own style as then practised at Agra and Delhi. They must also have been actuated by a wonderful aversion to anything savouring of Hinduism, when they designed a building so original as this, and one so manifestly unlike anything to be found in the country in which they had settled." Bearing in mind however, that the Moslim population of the South was formed of a miscellaneous collection of foreigners, Pathans, Moghals Abyssinians, and others, the bulk proceeding from the North; that

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everywhere these men adopted Hindu buildings and temples to serve as mosques; and that the founder of the Bahminy dynasty, Allanddin Hussan, (1347 A. D.,) was a native of Delhi who expelled the Emperor Muhammud Tughlak from Dowlatabad where he had transferred the capital of the Pathan Empire, it is difficult to believe they were so perfectly ignorant of stone architecture as to be under the necessity of copying from wood, and still more difficult to suppose that those who built the largest dome on earth, between 1640 and 1660 A. D. larger even than that of St. Peter at Rome, had, three reigns anteriorly, between 1550 and 1557, so little experience in building in stone, as to copy from wood, and that at a time when the intercourse between the North and the South, was perfectly uninterrupted for considerably our three centuries. We believe survival of custom exerted a much more potent influence in such cases than ignorance. Adverting to the caves of Kennari, at Salsette, Mr. Furgusson observes: "Although the style begins in wood and ends in stone, it is not a little startling to find so little change either in the plan, or general disposition of these caves, during the ten centuries through which we can certainly trace them." And to account for the peculiarity he adds. "The cave at Kennari or the last at Ajunta, is practically identical with that at Karli, in so far as its general plan and design is concerned, and even the last retains so strongly a reminiscence of its wooden origin, that we have little reason to doubt, that the practice of erecting such halls, in that perishable material was continued contemporaneously." This solution of the difficulty, however, is by no means favourable to the position assumed by the author, that architecture in India must have commenced after the invasion of Alexander, (250 B. C.,) because all the earliest specimens show traces of their wooden origin.

"If those traces are visible in stone structures raised twelve centuries afterwards, and may be accounted for by the assumption of imitation from contemporaneous structures, the argument would lose little of its force when applied to the erections and excavations of the time of Asoka, and of his immediate successors. Wooden houses have existed at all times, and exist to this day; but they afford no reason to suppose that races who have known stone houses for a thousand years, in copying wooden features in stone, do so directly from wood, and not from stone which has preserved those features from generation to generation in a country, like India, where custom has exercised the most despotic sway, and held the mind of men in such abject slavery."

The last important feature which is unmistakeably designed for stone is the floor of the Ladies' platform.

Here also as elsewhere, the architect appears to have been bound by the ready-made material available; for, as will be seen from plates XVII and XX, some of the squares between the supporting pillars, are floored by slabs 5″ thick laid across from beam to beam, the beams themselves running squarely, from the double brackets of one set of pillars, to the double brackets of the opposite set of pillars; the slabs in these cases, being obviously, and necessarily long enough, to span the clear space across; while in other squares, the flooring is supported, not by slabs running across from beam to beam, of the principal set of beams, laid squarely across from pillar to pillar; but these principal beams, 12″ × 11″, support a secondary set of beams, 7″ × 5,″ laid diagonally across, and partially cut into them; the space inclosed by these secondary beams, being exactly half that, inclosed between the primary beams; the beams being so cut and fitted into the main beams, that the upper surfaces, of both the primary, and of the secondary beams, are on the same level; it is obvious that by this means, the clear open spaces, to be slabbed across, are reduced very considerably, and smaller slabs could be used, and were so used, as may be seen from the remains yet existing, or fragments with mitred ends, lying about.

But, as in most *early* examples, where Indian Architects have used stone for roofing purposes, the stone used, has been used, more as timber, than as stone; the cutting away of half the breadth of the principal beams, to a depth of 2½ inches, and the further cutting away of half of this cut portion, to a further depth of another 2½ inches, so as to get a secure stepped seat, for the mitred end of the beams laid diagonally across, is a construction, which, one would hardly expect to see in stone; it is essentially a piece of carpentry performed in stone, and must be condemned as faulty in the abstract; but in the particular instances in question, the architect had evidently tested, and found the construction sufficient; for though the principal beams are thus weakened, in their naturally very weakest part, the centre, enough material was left, to safely carry the load of 5″ polished basalt flooring; and though *portions* of the domes have fallen in at some time on these floors, and the floor slabs themselves, have been violently prized away, the beams have, with one solitary, rather doubtful, exception, stood intact, and stand intact to this day, ready to receive and safely sustain, a fresh flooring whenever one may be put on.

It is clear therefore, that granite beams, with a clear span (I take the clear span between the ends of the corbels only for safety) of 6½ feet., and a sectional area of 12″ × 11″ less 5½ × 2½ and 2½ × 2½ or altogether, an available resisting sectional area of 110

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square inches, disposed, (making roughly the necessary allowances for the cuttings,) as a beam 11″ × 10″ have been found, amply capable of bearing a permanent load of 58 cwt. (being that of a quarter square of the flooring, and of the minor set of beams) a moving load of say 4 cwt. ; and the incidental shocks of accident and design, for 500 years. Putting these data into the form of the ordinary equation of transverse strength, and assuming the beam to be just able to hear these, with the minimum factor of safety engineers have found necessary to allow, the value of the constant C, is, for this granite, found to be 1·3 cwt. : that is a piece of granite one inch square and a foot long in clear span between its supports, would be just broken by a weight of 1·3 cwt. applied to its centre.

For details of calculation see Appendix II.

The rest of the features constructive as well as ornamental appear obviously designed for brick. The vaulting, the arches, the domes, each heavy, and involving thrusts which had to be provided against and balanced, are obviously necessitated by the absence of stone beams and slabs, long enough to perform the work ; but even the ornamental features are designed for brick ; it was only a brick cornice which in such a great building would have been confined to a maximum projection of 12″ inches, and it is because the cornice is of brick that the successive small projections (the lowest being a freize projection only 2″ inches but of a depth of from 6 to 8 bricks or 9″ to 12″ inches, so as without breaking to furnish a basis for, and to bear the weight of, the superincumbent mass of projections), have become necessary as constructive expedients rather than as pure ornament ; I invite attention to the three successive freizes which lead up to the cornice, each projecting a little beyond its predecessor ; but as three successive superposed deep freizes would have been more singular than tasteful, a correct perception of beauty has interposed minor lines of mouldings and ornamented bands between them, their own surfaces being also ornamented with different patterns, so that without a tedius uniformity, they make up a whole seldom surpassed in elegance, and (remembering the material) in boldness ; I also invite special attention to the numerous receding steps between the topmost projection of the cornice and the base of the battlement, also a constructive necessity so as to preserve bond and insure the pressing down of the inner edges of the overhanging bricks of the cornice, but so proportioned and disposed, as to add dignity to the battlements, and to produce an impression of bold massiveness, which the dimensions alone would fail to impart, see plate 22 cornice marked *C* and the corresponding principal cornices which go round the

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building in the other plates. The minor cornices confined to particular parts or introduced to reduce the excess of a dead blank wall where such would obviously obtrude, though neither so deep nor so elaborate, are each however designed on the same broad necessities of the construtive material, and the same correct appreciation of true elegance of form and proportion (for details of proportions see Appendix IV).

Comparing in a general way the Adina Masjid built in A. D. 1370 with the Masjid in Jaunpur, of which the Atala dating to Ibrahim Sharki and built in A. D. 1403. (Cunningham XI) resembles it most closely, it will be seen, that one of the principal points of difference is the long line of arches facing the inner courtyard all round, in place of the colonnade. There is little doubt that if beams and architraves in sufficient abundance had been forthcoming, the architect would not have employed arches to support his domes, and heavy piers to resist the final unbalanced thrusts: it is because these were not forthcoming that the more unstable and very much more expensive construction was necessitated by the compulsory use of brick as a building material.

Further in the construction of the great vault, it was mainly the use of brick as building material, that induced the use of the wooden architrave spoken of in page 22 supra ; with long stone slabs available, they would themselves have formed the wall plates and obviated the need of wooden wall plates, with the most probable result that the vault would have been now still standing.

That the use of wooden wall plates under the vault, to spring from, was a well known and well recognised and practised method of construction with Indian Architects, is curiously illustrated in such a widely diverse building as the great Temple at Buddha Gaya. There it was found that the great vault over the Mahamandapa on the ground floor, which had long fallen but of which the springing was still intact when I saw it (and dismantled it as late as 1882) was found to have sprung from wall plates of Sal, of which portions were actually found by me undecayed ; these wall plates were placed precisely as the ones in the Adina Masjid, and their inner ends were for a short distance let into the flat end-wall of the vaulted room precisely as here, photograph plates 94-98 shews the rectangular socket hole into which the wall plate was inserted in the Adina Masjid quite distinct, I have marked it C; but the wood had wholly decayed, and the cavity was used as a nest by owls, which startled Babu Rajmohan Banerjya and were equally startled by him, when he made his examination and measurements.

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The vault spoken of in Buddha Gaya was clearly Barmese, all authorities are now I believe agreed as to this, and as I am not now writing a report on Buddha Gaya, I content myself by saying that the vault, by the latest research, appears to have been built about A. D. 1080, by the Barmese, in restoration of the vault seen by Hiouen Thsang at an earlier period. This is I understand General Sir Alexander Cunningham's opinion after careful collation of the very extensive mass of facts disclosed during the late repairs, and though yet unpublished, I as his disciple, have had the privilege of learning the most recent views of my venerable and venerated teacher on the subject.

The vault however was by no means a plain sheet vaulting, photographs and plates 6, 94, 98 will prove conclusively that the vault sheeting was strengthened at frequent intervals by projecting arched ribs of the same shape; these arched ribs, (see section plate 6) appear to have projected inwards about 8 inches, (there is not sufficient material available to fix with absolute accuracy the exact number of inches the ribs projected, but whether 6 or 8 inches is immaterial for the purpose now in view, the elucidation of a remarkable feature) the ribs appear to me to have been of stone, not only because a number of large stones which would suit the ribs, were actually found among the debris on the floor of the vault, and must have fallen from the vault, the sheeting of which was wholly of brick, but because in support of this, the only rational explanation of their presence in the debris of the vault, there is the further circumstance, that the marks still existing on portions of the vault, shew beyond the possibility of doult, that the extrados of these ribs extended beyond the intrados of the brick sheet vaulting by as much as 4 inches, as they have in every instance where they occurred left distinct *depressed sharply defined channels* and in no single instance is any single portion of these channels interrupted by projecting *adhering fragments of brick work*, which, had the ribs been of brick, would have unavoidably been left in some one or more portions, even if the existing brickwork of the vault, had not shewn that had the ribs been of brick they would have been carefully bonded into the superposed vault sheeting, and therefore would not, and could not, have left the clear, sharply defined depressed channels, which now exist and were for a long time a puzzle to me.

Supposing however, stone arch ribs 12 inches thick had been built at the points to be presently indicated, and the brick arch sheeting, built with its intrados struck with the radius necessary to leave 8 inches of these stone ribs projecting internally: and that in the general ruin of the vault, these stone arch ribs also fell,

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as indeed they could not avoid doing when, as will be shewn the abutments gave way, what would be the resulting appearance of the ruin ?

It is clear that the brick sheet vaulting and its backing, built of bricks and good mortar as they undoubtedly were, would remain intact in the lower parts of the vault from the circumstance that (1) the brickwork vault-sheeting and its backing, with their numerous joints filled with mortar, would, with good mortar, form as it were one mass, which, *up to a certain point,* would remain overhanging ; the weight of the backing forming as it were one mass with the sheeting, keeping the overhanging portion of the sheeting from over balancing and falling in, (2) the the overhang would, in the case of the brick vault sheeting, which sprang *flush* from the supporting wall, be at any point, very little, *compared with the overhang of the same point of the stone rib*, whose intrados was not *flush* with the supporting wall or pilaster, but began at its very start with an *initial corbelled overhang* of 8 inches.

Consequently as the stone rib was but 12″ thick, of which only 4 inches at the springing rested directly on the supports, the rest, (whether the corbelled projection P. on plate 5 were 8″ or 6″) being really all overhanging from its very starting, and only kept in position by the thrust of the arch against the abutments ; it would, as soon as the abutments gave way, fall in, and as the very lowest courses of the stone rib and the corbelled stone from which it sprang, were all really overhanging, and as from the fewness of joints, the impossibility of properly bonding brick work and stone work, and the naturally weak adhesion of brick work to stone work, the force holding the stone by *force of mortar to the brick backing would be small,* (if not immediately yet assuredly in the course of a very short time), every single stone of these stone arch ribs down to the corbelled projection inclusive, would get detached from its backing, and fall in on the debris inside, on the floor of the vaulted chamber.

The result would be, that the appearance presented by the ruins of the vault would be *exactly* what the ruins now actually present.

The importance of the subject must be my apology for such a lengthy disquisition on this one topic ; the instances of vaulted sheeting built on arched ribs are so rare, (I can now only call to mind Islam Shah's bridge over the stream separating his detached island fortress of Selimgarh from the mainland) that it appears to me necessary to establish, with the amplest proofs, the occurrence of this rare architectural feature in the Masjid here, built so much earlier than any other known example, in fact ; this is the first and ear-

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liest instance of the use of arched ribs strengthening vault-sheeting, that I am aware of in India.

The existence of the marks of the ribs in the remains of the vault, is naturally to me, as to every one else absolute proof of ribs having at one time existed.

But to me the presence of large numbers of cut stone in the debris which I removed some years ago from the floor of the great nave, is the most convincing argument of the ribs having been of stone; and it may be useful to some, and will certainly help to relieve the tedium to all, of reading a heavy professional report, for me to relate how it happens, that the actual existence in the debris of the vault, of the squared stones which I removed, is to me the most conclusive proof of the vault ribs having been of stone.

In 1874 I was at Bharhut with General Sir Alexander Cunningham, engaged in excavating the great stupa; naturally the mechanical work of supervising the excavations and taking measurements and photographs fell to me, while General Cunningham did the mental work: One gateway pillar was standing, a fragment, the magar (or alligator) end of the cross beams had been found, see plate IX Bharhut stupa, and there the matter rested for some time, while my attention was devoted rather to the exhuming of the numerous coping pillars, &c., meanwhile however small non-descript battered fragments of no value whatever as sculpture, were being occasionally found and thrown aside, as uninteresting battered and mutilated fragments. At the close of each day, during or after dinner I would report to him the day's progress and finds.

One day my poor little boy (whom I have lost since) carried as a curiosity to General Cunningham, one of the very smallest of the fragments which I had considered of no importance, and with which consequently he was allowed to play; when I saw General Cunningham that evening, he was somewhat more excited than usual, shewed me the small *fragment* of a small sculptured horses head which my son had carried to him, and said it was a very important fragment, were there more such fragments?

Next day I sent to him a heap of, as I thought, perfectly useless fragments which had been found, and as it happened had been found in the vicinity of the gateway pillar. The fragments of Toran beams with the elephants, and the one with the lions were also found in due course and were of course at once recognised by me as well as by General Cunningham; all these pieces he ordered me to photograph to scale which I did.

In a few days to my astonishment, I saw a great sheet of paper on which he had drawn the Toran gateway; not then quite

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so complete as it is in plate VI Bharhut (which is a reduced photogaph of the original sheet) but very far towards completion.

It appeared then to me almost as if he had done it by a happy inspiration; but he explained to me step by step every detail of the train of reasoning that guided him, and then I found that it was the accidental presenting of that little fragment, which in my conceit I had considered useless, that had led to the restoration (on paper) of the gateway.

His good humoured but sarcastic remarks to me, as to whether I thought the pieces which were found had rained down from the sky, or whether I thought the architect who built the gateway did not know his business, but had collected all sorts of irrelevant sculpture to play with; thoroughly took all the conceit out of me then, and I hope the greater portion of it permanently; (but vices are hard to kill) and I learnt the full value of his kind advice to me, which, as it is the most valuable advice I ever received regarding my present profession, and as the days of exclusive guilds when bodies of men *combined to keep all professional secrets in their exclusive rings, have or ought to have passed away*, I give in substance.

If you wish to understand and enter into the spirit of any work, do not begin by assuming that because the man who did that work, lived, in what you consider barbarous times, that he did not know his business as well as you do. On the contrary, to succeed in understanding the work, you must begin by assuming, that the man knew his business at least as well as you can possibly do, and probably very much better.

Can it be matter of surprise that this man, who with his high official position, his admitted authority as one of the fathers of Indian Archæology, and what is not so well known, his vast general knowledge, and remarkable conversational powers, was so free from an unworthy desire to keep the secret of his success in research to himself as to give freely to one who had no manner of claim whatever on him, the advice he did; and so void of conceit as habitually to be able to act on it himself, has earned the respect of almost every one who knows him, and from me who have been in constant friendly and respectful intercourse with him for 18 years, not merely respect, but the much deeper feeling of veneration?

Those questions of his, whether I thought they rained from the sky, or whether I thought the architect collected them to play with, always occur to me now when something turns up during exploration which I cannot at once explain or account for. It could be the interest of no one to have brought the squared stones and buried them in the rubbish, where I found them; and they certainly did not rain from the sky.

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The last important feature which it is necessary to touch on here, is the screen wall in front of the vault. It is impossible that the great arched opening 48′ 0″ feet high could have been left wholly open for rain to beat in during 6 months in the year, and render worship there in personal comfort impossible, nor, comparing it with the Atala Masjid, (Cunningham vol. XI pl. 36 can there be any doubt, that a screen wall of some kind, with moderate sized entrances, and one or two tiers of windows closed the great opening and sheltered the worshippers from sun and rain. The projecting stones of the ribs at P. P. see plate 6 and photograph plate 98 limit the thickness of the screen wall to 28 inches, and there is no option but to accept this 28 inches as the thickness of the wall; it is not sufficient, remembering that the wall was 48 feet high and that it rested merely on the floor of the vault, for permanent stability; but since, as long as the ribs P. P. pl. VI stood, the upper part of the wall from a height of 27 feet above the floor, right to the top, was safely nipped between these ribs, and not liable to be moved; the wall would be safe so long as these ribs remained intact; when however the giving way of the abutments caused the destruction of these ribs (and of the vault) this thin wall 28 inches thick and 48 feet high, obviously not bonded into the side walls, (as may be seen from the photograph plate 98 where the entire South surface of the North abutment, of which a vertical strip 28 inches in width, must have been covered by the screen wall, is seen to be perfectly smooth and therefore never bonded with the screen wall), and as before said, only resting on the stone paved floor of the nave, would he very shaky, and would be liable to destruction, not by gradual disintegration, but by falling down flat *enbloc*. And this is what appears to have actually happened, for no trace whatever of the wall exists or was found.

Had the wall been of stone, the stones would have been lying where the wall fell, in fairly close order to be unmistakeable, and possibly even capable of furnishing with moderate accuracy the sizes and number of the openings (windows and doorways) in it, but such was not the case, the wall was therefore I conclude of brick, which of course when it fell broke into too many pieces, and were too confused with the debris of the spandril of the great arch and of the battlements and upper parts of the abutments, to retain any identity of itself, or to furnish any useful information regarding the sizes of the openings.

It will have been seen that the architect, careless though he was to an extent which modern Indian P. W. Architects would not be guilty of, had so far designed the building not only with great success in an æsthetic point of view, but had kept clearly

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in view the materials available to hand, so as to utilise them to the utmost; and but for a very serious error of calculation to be noticed further on, had shewn himself a good Engineer as well as an able architect: no less clearly has he displayed his foresight and capacity in providing for the efficient drainage of the great building he was erecting.

It will be seen, on comparing plate 3 with any of the Sections of the West main vault or cloisters, that the pillars in plate 3 of the East cloisters are much taller and the springing of the domes, as well as the positions of the cornices, much higher with regard to the floor, than in the West cloisters; even the ornamental shallow niches on the outer or East facade of the East cloisters plate 2 are much taller (and consequently *appear* narrower) than the corresponding ones on the West or back facade of the West cloisters. This is due to the circumstance of the floor of the East cloisters at its lowest point, being as much as 5′ 0″ feet lower than the floor of the great nave of the Central vault, which is, (except the floor of the Ladies' Chamber) the highest point in the floor of the Masjid.

A careful examination of the various detail sections will shew that the heights of the pillars and niches, and the springings of the arches over the pillars, and of the domes they carry, vary considerably. All these variations, (except the variations in the springing and heights of the arches which immediately face the inner Courtyard on the 4 sides and which will be separately noticed) are due to the circumstance that the entire floor slopes gently, from the nave as its highest point to the portion of the East cloisters at the Gargoyle, as its lowest; the floor has a double slope, (1) the slope already noticed running from the nave along the North half-length of the West, the entire of the North, and part of the East cloisters on the one side, and along the South half of the West, the entire of the South, and part of the East cloisters on the other; to the point opposite the Gargoyle as the lowest point, and (2) a transverse slope from the prayer niches on the West, and the various lattices on the North, South and East cloisters, inwards towards the Courtyard. This transverse slope amounts in the case of the great nave to 9½″, in the West cloisters to 9″ and in proportion in the narrower N. S. and E. cloisters; to avoid complication this transverse slope has not been shewn in the drawings.

It is clear that all water, rain or other, which found its way into the cloisters would be at once discharged into the inner Courtyard all round.

But along the foot of the line of arches all round the inner Courtyard, ran at one time, a shallow (6 inches deep) catch water pakka terraced drain, the dimensions of this drain being, a bottom width of about 2 feet, with very flat sloping sides; the whole of beaten concrete terracing; the entire width of the drain (I estimate for no part was found quite intact) at the top being about 5 feet.

Into this drain would necessarily drain not only all stray water from the cloisters and all the water from the Courtyard, which was so levelled as to lead into it, but also the water from half the roofing of the Masjid and cloisters; the roof in the case of the West cloisters having a fall of no less than 3′ 5″ transversely from the centre, obtained by the coat of concrete in the spaces between the domes, at the centre, being thicker than at the edges: the roofs of the other cloisters sloping in similar proportion.

This drain, following the slope of the floor of the Courtyard, had its final outlet into a covered, stone lined, underground channel, which passing under, and across the East cloisters, discharged the accumulated waters, from the Gargoyle shewn in plate 3, into a brick stepped channel; which by means of a succession of slopes and falls, eventually delivered the waters into the tank marked 3 in the index plate.

The slope given to the drain (and to the floor) within the inner Courtyard, was accordingly measuring the length along the line of flow, 7·0 Inches per 100 feet, a slope far more than was needed, but assuredly it possessed the advantage of discharging with corresponding rapidity and efficiency. Its destruction I ascribe, not to its excessive slope, but to there being no protecting slabs of hard stone inserted at intervals to receive the shock of the water flowing down from the roofs.

The excavations undertaken some years ago did not disclose whether the Courtyard was wholly terraced throughout; it assuredly was not paved with stone slabs, but I infer from the circumstance that large tree jangal was not growing in the court, but rather a bushy thorny scrub (infinitely more troublesome to cut, and more destructive to the clothing of adventurous explorers) that the court was once terraced pakka; as it is a commonly known fact, that tree jangal does not take kindly to ground beaten down hard and covered pakka with beaten concrete over a layer of brick.

It has been said that the level of the outer Courtyard at the East is now 5½′ feet lower than the level of the Courtyard on the West side, (judging from the exhumed terracing over the ghat in Tank I of the Index plate.

From the levels of the various plinths along the outside of the building, the outer plinth does not appear to have been sloped longitudinally; it would necessarily have to be stepped somewhere. That it was so stepped, was shewn in the buried lower footings of

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the East wall of the East cloisters, but the North and South plinths were not in sufficiently good order to enable the stepping to be ascertained, though there can be no doubt that it was stepped at intervals to keep in some sort of harmony with the fall in the ground level. The total difference between the level of the plinth on the West face which is the highest, and the lowest on the East face, being 3′ (that of the ground level being already said 5½′). I do not remember, (nor does Babu Rajmohan) its being stepped on the West face.

The nature of the soil is unfavourable to drainage. A red ferruginous clay which appears to have the property of obstinately retaining water (as I have had very good reason to know to my cost, during the excavations to ascertain the footings in the East wall and in digging the new well in the inner Courtyard) appears to have been, and probably was one reason, why the architect considered it necessary to give the great slope that he did, so as to obviate as far as possible, the soaking of the moisture into this intractable bed ; below this, a yellow clay with nodules of kankar gradually increasing in size and frequency, terminates at last in a hard deposit of solid block-kankar, at a depth of 25 feet below the court : into this hard kankar the digging was carried for a few feet to obtain fairly good water, the kankar continuing solid, but, as usual with kankars, with numerous cavities throughout.

The total area roofed over, including the area of points of support amounts to 85,000 superficial feet, supported at the floor level on 12,500 superficial feet of walls and pillars, giving an average of 6·8 to 1, or say in round numbers 1 to 7 as the proportion of the area at the floor level of the points of support to the area roofed over ; but of this the pillars aggregating 2,000 superficial feet, support 45,000 superficial feet, leaving only 4,000 superficial fete of area roofed over, as directly supported by the walls and piers, which gives for the portion supported by the pillars a proportion of 1 to 22·5 at the floor level at their bases, and of 1 to 75 only for the shafts ; and for the walls of 1 to 4, remembering that in both cases the area of the points of support is included in the area roofed over.

Including the open courtyard inside, we shall have an average of 1 to 14 as the proportion of the area of the points of support to the total area of the Masjid within its four outer facades.

The total volume of air-space inclosed amounts to 1,800,000 cubic feet, and the total volume of masonry employed in effecting this amounts to 80,000 cubic feet, giving a proportion of 2·5 cubic feet of air-space per cubic feet of masonry exclusive of foundations and floor. Including foundations and floor, and *assuming* that the foundations are not less than 6 feet

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in depth (the excavations were carried down 5 feet in depth in two places without coming to the beginning of the foundations) there would be in this building, a total expenditure of 9,80,000 cubic feet of masonry for inclosing 18,00,000 cubic feet of air space, and for roofing 85,000 superficial feet shelter, or in other words each, cubic feet of masonry helps to roof only ·087 superficial feet of surface, and to inclose 1·84 cubic feet of air space. It must be noted that the above calculations, of area roofed over, includes the area of walling also. Excluding this, the averages shew, that in this building each cubic foot of masonry (including the floor estimated at a foot thick and the foundations) roofs over ·075 superficial feet of available clear area, and incloses 1·84 cubic foot of air space.

The intensily of pressure at the floor level will be found to be; assuming 115 lbs. for the weight per cubic foot of the mixed stone and brick work; on an average, 3⅓ tons per square foot; this however is an illusory average, as the pressure is very unequally distributed, there being a total pressure of 39,000 tons on 10,300 superficial feet of walling and of 3,300 tons on 2,000 superficial feet of pillars or an average for walls of 3·8 tons per square foot, and for pillars of 1·65 tons per square foot at their bases. But this rises to 4⅔ tons per superficial feet for their shafts at the springing of the arches.

The intensity of pressure on the foundations, is found to be 3·45 tons per square foot of walling; but for the pillars, as I have reason to believe that they are built on the floor without any special long lines of walls for foundations as would now be invariably done, the intensity of pressure would continue to be 1·65 tons per square foot.

In the Public Works Department, Bengal, the intensity of pressure which is regarded as safe (for Calcutta) is 1½ tons per square foot.

In the pillars the maximum intensity of pressure, on any point occurs, not as may be supposed at the foot of the shaft of the tallest pillar of the East cloisters, where it is only 3·6 tons per square foot, but at the necks of the capitals whence the arches spring, where it is 4⅔ tons per superficial foot.

On the piers and abutments of the vault, the direct downward pressure on the piers amounts to 12½ tons per square foot, an amount no longer within the margin of safe pressure; on the abutments it is 4·9 tons per superficial foot; for details of pressure on various parts, see Appendix III.

As regards other forces in the building, the only one that is of any practical importance is the question of thrusts, here however at the outset, it is obvious that they may be divided into two broad classes, the thrusts of the arches in the building varying in span to a maximum of 11½ feet, and the thrusts of the great central vault and its front arch.

In regard to the former it is obvious that they may be subdivided into two classes, arches which spring from piers, and those which spring from pillars.

The piers are so massive, that it would be pedantry to proceed to calculate the thrusts, which cannot by any possibility even approach the limits of stability of the piers, as will be obvious to any professional engineer; nor, but for precisely a converse reason, is it necessary to calculate the possible thrusts of the arches with their heavy load of domes 2 feet thick which spring from pillars of only 10 inches radius at the neck, which it is equally obvious cannot be expected to resist the thrust. I am aware there is among non-professionals (non-engineers) a vague notion that every arch springing from horizontal skewbacks (that is the bed of whose lowest voissoir is horizonal) has no thrust; this report does not profess to be a treatise on applied mechanics and I would refer them to Moseley's Chapters on the theory of the arch, to Rankine, Wiesbach, and others, for a refutation of this fallacy In the second class, the great arch of the vault is (see plates 5,6 almost identically the same as the arch of the vault, and the only material variation is the load thereon; practically therefore if the conditions of stability of the vault are determined, all that is really necessary will have been done.

In doing this however there is a serious difficulty owing to the circumstance that the vault does not exist, and although there is no doubt as to its form, there is nothing to shew how it was loaded at the crown; for that it had a load of some kind on its crown, appears absolutely certain from every other example that I have yet seen (without exception).

To get round this difficulty which cannot be surmounted it has appeared desirable to investigate the conditions of its stability within practically limiting conditions of the load, and the details will be found in Appendix III.

By shifting the position of T and Q Pl,88. it is obvious that the intensities and directions of the limiting pressures may be found for any number of points, and the curve of pressures drawn, but it is also clear from the form of the final equation, and the direction of the final thrust with the minimum of load, that the curve of pressures can never cut the *intrados* between the points T and C so long as the load on the crown is above that minimum; and similarly that so long as the pressure does not exceed the maximum of the calculation, the curve of pressures cannot cut the extrados of the vault, assuming the extrados to be of the form drawn; that is the arch together with its solid backing.

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As the backing with good mortar forms practically one solid mass with the arch sheet proper, this last assumption though wrong in theory, is *under the actual conditions*, not unwarrantable.

But as the *direction* of the final thrust cuts the arch intrados below the point T. (see plate 88 diagram of forces), it is clear that for the stability of the arch, considered in itself, that is with absolutely immoveable abutments, the load on the crown must be greater than the minimum calculated as necessary to insure the portion TC not turning down round round T.

It is also obvious from the equation of the final thurst, that in order to save the intrados below T from being cut by the line of pressure by increasing the load on the crown, the *intensity* of the thrust will be very materially increased.

But already the equation of moments shews that even with the minimum of pressure the moment of forces tending to overturn the piers closely approaches the moment of forces tending to keep the piers from overturning.

Therefore it is clear that the loading needful to prevent the line of pressures from cutting the intrados below T, and thus causing destruction to the arch, not by the overturning of its piers, but by the revolution of portions of the arch round the points of rupture, will land us in the no less serious difficulty of causing the destruction of the arch by the overturning of its piers.

It will be noticed also that there has not been allowed, nor is there room, even with the minimum of pressures, for any "factor of safety."

The overturning of the piers, would however not take place, notwithstanding that the moment of overturning exceeded the moment of stability, so long, and only so long, as the counter pressure of the heavily loaded arches of the adjacent aisles acted on the pier to help in preserving it from being overthrown.

It is therefore evident that the architect did load his arch sufficiently (by some rule of thumb process for it is clear he never could have actually calculated the forces and yet have deliberately left his piers so weak) to save it from destruction by the turning round of its pieces round the points of rupture, and the piers sustained the final thrust, solely in virtue, not of their own stability, but of the counter thrust of the arches of the adjacent aisles.

Of course such a state of things could not last. Not only was the direct crushing weight on the piers far in excess of what a due regard to the factor of safety would have permitted,

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but the centre of this pressure, was, by reason of the thrust, thrown further outwards than the centre of gravity of the pier base, still more increasing the intensity of direct crushing force on the outer courses, while somewhat relieving the inner courses. Add to this the fact of the piers being of themselves incompetent to sustain the horizontal portion of the thrust with its powerful leverage. (And only standing because of some counter thrust), and that the architect wound up the entire construction by springing his great arch from perishable wooden wall plates; and a combination of conditions is at once disclosed, which could not but *insure* the destruction of the vault.

No doubt the process of sinkage of the outer edge of the piers under the enormous pressure thrown on them, went on slowly for a number of years, while during that period, the gradual decay of the wall plates also steadily proceeded, until perhaps an earthquake which would have been of no consequence had these dangerous conditions not existed, completed the collapse of one set of piers, or the leakage of water from cracks (inevitably caused by the slow sinkage of the pier-foundations on the one hand, and of the arch springing at its intrados), lessened the already overstrained powers of resistance of the piers to direct crushing, and they partly crushed, and partly got pushed out of plumb, permitting the fall of the vault; the marvel being, not that the vault fell finally, but that it contrived to stand for a number of years.

With the fall of the vault and of one set of piers (the South piers) would naturally fall the adjacent arches and domes of the adjacent 2 or 3 aisles. and as this would leave the next row of arches and domes, borne only on the slender pillars, they would also fall, and this process would go on in aisle after aisle, not only till it reached the South end-wall of the Western range, but it would, on reaching the line of the South range of cloisters, involve them also in the same steady destruction. And when all the arches and domes of the South cloisters fell, the fall of their last domes and arches, would involve the destruction of the arches and domes of the South end of the East cloisters, every single arch and dome of which would fall in succession till it passed the destruction on to the North range of cloisters, and from this North range of cloisters, the destruction would extend to the North half of the West range, until finally it would reach the North piers which the fall of the great vault by the collapse of its South piers, relieved from the action of forces it was incapable of bearing with safety. This is what ought to happen.

What has happened is precisely this, only the destruction has not yet extended to the North piers of the great vault. See the

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index plate, as also Cunningham and Ravenshaw. Every single dome is gone except those between the North pier and the North (outer) end of the Ladies' platform; and these are also going one by one.

As the vault stood intact for a number of yeare, there was time for the mortar to harden, so that by the time it fell, the arches and domes resting on the pillars, were really solid masses which might be regarded as sculptured and hollowed out of a vast mountain of concrete, and they would not fall at once, nor, even if roots of trees cracked the masonry of any but the free standing end row of domes or piers; but when the root of a tree did crack an *end* dome or arch or pier, so as to remove the one condition of its safety, *viz.*, all its parts being so cemented together as to be one continuous solid piece, that dome would fall, and the next would await its turn.

In a report submitted to the Bengal Government in 1885, occurs the following passages.

"When seen by Ravenshaw, the only portion of the building which had roofs still existing, was a portion of the North cloisters, where 45 domes then stood intact: at present only 38 exist, and of these several are tottering and partially fallen; six domes have consequently quite fallen between the years 1867 and 1383, when I first saw the building, and one has fallen between 1883 and 1885."

"Ravenshaw's volume does not shew the state of the building sufficiently in detail, to enable a comparison to be drawn between its state then and now; but judging both from his and from General Cunningham's plan drawn in 1879, I gather that three of the arches on the South of the great main vault, and four of the arches of the South corrider then standing, have since fallen, as well as five arches of the North and South cloisters and three arches near the South-East corner, making a total of fifteen arches in the sixteen years between Ravenshaw's visit and my first visit, or nearly one arch a year. I have been myself obliged to pull down one arch which had become dangerous, to prevent its spontaneous collapse at some moment on my work people."

My experience has now extended another three years, and I find that since 1867, the year of Ravenshaw's visit, there has fallen altogether 20 arches and 9 domes in the 21 years. Supposing that the first 3 rows of arches and domes in the 3 aisles nearest the vault fell along with it, there would be a balance of 300 domes and 620 arches (in round numbers) fallen at some time from date of the fall of the vault to the current year. The rate of destruction must therefore have been much more rapid in previous years than it is now; probably the tall pillars of the East cloisters fell with

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their domes and arches, much more rapidly. Any way, as Pandua continued the capital down to the reign in 1392 of Jalaluddin who removed it to Gaur, it may be conjectured, that till then at least, the vault had not fallen; possibly the destruction of the great Masjid, was one, among other reasons, for the removal of the capital to Gaur.

If such were the case, the Adina Masjid built in A. D. 1369 stood intact for the brief period of 23 years, or say in round numbers 25 years: but even this period is more than a consideration of the combination of destructive agencies working against the unfortunate vault would warrant.

The arcs of the vault are described from centres on the springing line, and radius equal to $\frac{2}{3}$ span, in other words the span being divided into 3 parts the 2 points of division are the centres from which the arcs were struck.

All the open arch ways in the Masjid with the exception of the arch ways opening into the Courtyard are drawn on this; system, the radius being $\frac{2}{3}$ of the clear span at the springing, but it must be remembered that in every case except the vault the arches start at their springing with an initial over hang of a few inches; this of course helped to throw the point of action of the final resultant pressure inwards, that is more centrally over the pillars than would have been the case otherwise.

But with a careful consideration, for which the defective calculation of the forces acting in the vault would have little prepared us, the architect has varied the shapes of his arches to suit the greater or lesser forces acting on them, thus the arches over the lattices, which are not left open, but closed, and therefore, subjected to a lesser strain, have their curves struck with radii equal to $\frac{3}{5}$ span. thus making the curves of larger amplitude, and the crown lower; while the arches opening into the Courtyard which are all open and bear the weights of the battlements, and heavy cornices, in addition to their share of the load of roofing, are struck with radii equal to $\frac{5}{7}$ the span, thus giving curves of lesser amplitude and raising the crown higher than the $\frac{2}{3}$ span radius would have done; lastly the two arches on the two sides of the great central arch of the nave, which have to bear the heaviest load of all, see plate 6, are struck with radii equal to, $\frac{7}{9}$ the span.

There are lastly the trefoil arches, these bear no heavy weight and are purely ornamental, they may be divided into 2 broad classes, the Muhammadan, to be seen in every trefoiled prayer niche except two, and also in the niches outside, on the outer faces of the Masjid walls; and the Hindu, of which there are but two examples, *viz.*, the main prayer niche, and the niche shewn in plate 23 and marked N in the index plate. They differ

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some-what but not much: designating by *s* the clear span between the capitals of the pillars from which they spring, the centres from which the lower curves are struck, are in each case, $\frac{4}{5}s$ apart from each other and $\frac{1}{6}s$ above the springing line, and the radius with which they are struck is $\frac{1}{5}s$; the points of the cusps are $\frac{7}{8}s$ apart from each other, and as nearly as possible $\frac{1}{3}s$ above the springing line; but in the main prayer niche the upper member of the trefoil is almost a semicircle with a little turned up nose at the crown, struck from a centre at a height of $\frac{1}{3}$ of the distance between the cusps, (that is $\frac{1}{3}$ of $\frac{7}{8}s$) from the springing line, and a radius equal to half the distance between the cusps; in the smaller trefoil however, there are three centres, the two for the lower parts at a height of $\frac{1}{3}$ of the distance between the points of the cusps above the springing, as in the other case, but the curve being a compound one, the lower parts are struck with radius $\frac{1}{3}s$ each, and the upper curve struck in continuation of the lower curves, from a centre on the same line, and midway between the centres of the lower curves of the trefoil, that is at a height of $\frac{1}{6}s$ above the springing as in the other; this curve is also broken at its crown and turned upwards into a little peak to mark the crown.

The Muhammadan trefoil of the prayer niches are much simpler and not so graceful; its three curves are all struck with a radius equal to $\frac{2}{7}$ of the clear span, the two lower centres being on the springing line; here as in the Hindu trefoils, the curve of the upper trefoil is broken and turned up-wards to mark the crown.

In the outer niches, the same rules hold in some, with the exception that the crown is not turned upward, see plate 8, upper niche; but in others, the two lower niches are struck as just described, but the upper member is described from 2 centres on each side of the central chain at a height of $\frac{1}{3}$ the span from the springing line, with radii equal to $\frac{1}{6}$ the span.

There are cinque-foil cusped arches and arches with larger numbers of cusps; in most of them the curves are all struck with the same radius, but they are not of sufficient prominence to need a more detailed notice.

The proportions holding in the Hindu trefoil arches (the only kind of Hindu arching of which specimens exist in the Adina Masjid) is thus seen to be materially and radically different from the proportions used in the Muhammadan trefoil arches; no less pronounced is the difference between the proportions of Hindu rectangular openings and the Muhammadan.

There are 4 Hindu door frames in good order in the Adina Masjid, the two posterns marked D and Z and the two doorways in the Ladies' Chamber marked H and K (see index plate, and plates 15, 19, 21, 22). In each one of these, it will be found that the height is very nearly twice the breadth of the openings. Of Muhammadan square openings, there are none quite open, being either niches as in plates 11, 7, 18, 23 or filled in with lattice work ; see plates 2,3,22, but it will be found that the square frames of these lattices measure in height just 1½ times the breadth in some, and even less, see plate 1. Whether the inside, the middle or the outside of the various rectangular framings be taken, the proportions do not, except in two cases, come up to twice the breadth for the height ; one class of niches where the proportion is twice, is to be found in the upper row of rectangular niches on the South (and North) and East facades, where the rectangular space within the highly ornamented outer framing, is in height twice its breadth, see plates 1 and 2. In the lower arch-ways of the so called pulpit if we take the rectangular frame work within which the arches are set, see plates 13, 14, the proportion is also 2 to 1.

In the arched openings ; as the floor slopes, while the springing line of the arches is retained at the same level, there cannot be expected any definite proportion, but in the side archways of the vault, see plate 6, and in the archway of the side prayer niche, the height of the square portion below, is just about equal to the span, while in the small prayer niches along the aisles, the height from the lower mouldings to the springing of the trefoils, is 1½ times the span between the supporting pillars.

The proportions holding in the pillars that support the arch-ways, which are all Muhammadan varies naturally with the heights of the pillars, which necessarily vary as the floor on which they rest slopes, while their capitals are all placed at the same level. None of the 4 pillars, of the Ladies' Chamber have been found, nor even are the pilasters there intact to furnish the proportions, but in the lower massive pillars which support the Ladies' platform, the proportions are (taking the pillars as round, they are polygonal) the shaft equal to only 3 semidiameters and the entire pillar (base capital and corbelled sur-capital together) equal to 4⅛ semidiameters nearly, while in the round shafts supporting the arches, the shafts vary from 8 semidiameters to 11 as a maximum ; and the entire pillars from 10 to 15 semidiameters from floor to springing of arches over their capitals.

In the fluted pillars of the Ladies' platform, the shafts are only 4 semidiameters, and the entire pillars nearly 6 semidiameters These are all the Muhammadan pillars, the others are all Hindu, and the proportions are much more graceful ; most of them being 15 semidiameters altogether, with their shafts alone 11 semidiameters high, while some are more gracefully slender, being in the case of the thinnest, 15½ semidia-

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meters high altogether. But the shafts of these Hindu pillars are all of single stones, monoliths, and notwithstanding their slender proportions are a great deal stronger than the built muhammadan pillars, built too in the slipshod style mentioned in page 24 supra.

The external corner towers which possess in some sort the characteristics of pillars, the proportions are for the Kumbha base or attached mouldings of shaft, 1½ semidiameters nearly; for the shaft up to the first band 2 semidiameters, the band itself being 1 semidiameter in height, then shafting again 3 semidiameters in height, which brings the total height of what may be considered the whole shaft up to the capital to 7½ semidiameters; surmounted by the main cornice (which may be taken to represent the capital) 2 semidiameters in height (as stated in page 39 sup, the recedings steps above the cornice I regard as belonging to the battlement.) The total height of the tower (from the top of the mouldings common to it and to the walls) including attached Kumbha base, capital, and upper neck, between the capital and the dome, being 12 semidiameters and the conjectural height to the summit of the pinnacle, 14 semidiameters; the basement moulding, which may be taken in place of the bases of pillars, being in addition just 1½ semidiameters, see plate I.

For details of the proportions holding in the various kinds of pillars used in this Masjid, see Appendix IV.

I have called the trefoil arches in the main prayer niche and in niche N. Hindu; apart from the marked difference between the construction and proportions of these niches and those in brick work, and which for that reason alone are undeniably Muhammadan, I would invite a comparison between the trefoils in plates 11 and 23 and in 108, the latter of which can have no possible suspicion of being even remotely influenced by Muhammadan architecture or ideas; and the result of the comparison must prove conclusively, that the trefoils in plates 11, 23 and 108 belong to the same age. It is worthy of note that the blue stone work in the Temple at Buddha Gaya, of a stupa sculptured in which, the plate 108 is a photograph, dates to the reign, so far as we now know, of Purnna Varmma, contemporary of the great Aditya Sena Deva, the Adisur of Bengal, to whom I have on wholly independent grounds, ascribed the construction of the Temple (see p. 11, 12 sup) of which the site is occupied by, and the materials utilised in the Adina Masjid.

The spandrils of the arches, and more especially those whether openings or closed niches, which are set in rectangular panels, are in many cases ornamented with bosses; my impression, judging from remains of some plaster bosses (see plate 99) is that every arch without exception, had these bosses, whether cut in stone, or moulded or cut in brick or in plaster; the two former have remained while the majority which was only in plaster, have fallen off leaving no trace, for these and similar ornaments cut in plaster, have in many cases (see page 27 ante) fallen off and left no traces.

Be this as it may, those that exist are of various sizes and variously ornamented; plain, moderately carved or most elaborately sculptured; the very finest are certainly the pair in cut basalt with the fir cone projecting boldly from the centre of one (the other fir cone has fallen off) on the West wall of the nave; they are not properly bosses on the spandrils of any arch; but from examples elsewhere, I have reason to affirm, that they are the counterparts of those on the spandrils of the front entrance archway; occupying on the West wall the position which the bosses in the front screen-wall (which as before said see page 45 ante has long ago fallen) must have occupied on the spandrils of the central entrance.

Incidentally, supposing my conjecture correct, some slight clue is furnished of the span and height of the arch: for as will be shewn below, the boss, if it followed the law which appears, to have regulated the positions of the other bosses in the Masjid, was inserted at a depth below the top of the panel inclosing the arch, of $\frac{1}{3}$ its distance or height from the springing of the arch.

And as the top of the panel was in all probability at the springing of the great arch or vault, which would the most appropriate place for such a marked horizontal line across the front, and as the centre of the boss is 48" below the springing of the vault, the springing of the inner small arch within the panel would be at 144 inches below the springing of the vault; that is 187 inches, or 15½ feet above the floor of the nave and if, as is probable, the thickness of the arch at the crown was 24 inches (it could scarcely be very materially more or less), and if, as is also natural and probable, the extrados of the crown touched the line of the panel at top, the crown of the intrados would be at 307 inches above the floor of the nave.

But as the arches are described in the vast majority of cases, and in the vault itself, with radii equal to $\frac{2}{3}$ the span, a very simple calculation shews, that the breadth of the opening would be 186 inches or 15½ feet; the height of the rectangular portion of the opening has already been determined to have been 15½ feet, and these numbers, are, not only in themselves probable, but the proportion of breadtn to height being precisely that, which, as stated above, page 56 holds in regard to all other openings leading to or from the vault, the probability is rendered all the greater, that in thus calculating out the dimensions of this opening, the correct laws have been used, and a fairly correct result obtained.

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As the distances between the centres of the bosses is 296 inches, the breadth across, of the panel, within which the entrance arch was pierced, must have been 380 inches according to the law regulating the proportions to be presently noticed; drawing these various lines, the outline or rather the skeleton of the panel and entrance arch; the result is seen in plate 24 section on line SSS, where CTZ shews the outline of the half arch, and IJY the outline of the half panel.

If after what has been said above further confirmation were necessary, that in the calculations just made, the correct laws have been used, such confirmation would be furnished by the dotted outline CTZ of the arch, which is seen to be just such as to display to the full, and no more, the whole of the superbly ornamented front main prayer niche. What the forms or numbers of the openings were, which filled the lancet shaped space on the front screen-wall above the line of panel IJ, there appears to be no means of calculating with even approximate probability, all that can with any certainly be said, judging from the Atala Masjid so often alluded to, is, that this space was assuredly not left a dead blank wall.

The bosses on the spandrils of the trefoil of the central or main prayer niche, are also fine, and must once have been adorned at their centres by some precious stone, which has since been extracted, and it appears the dispoilers whoever they were, broke the North boss partially, to extract the stone; it is not now possible I fear to determine what the stones were, but I am inclined to believe that they were turquoiuses.

The law which appears to regulate the position of the bosses appears to be, that the distance apart between their centres, is a definite proportion of the *breadth* of the panel, within which is cut the arch, on whose spandrils the bosses are; this proportion is found to be from the average of the details of 19 examples, in Appendix IV to be 0·78, but as it is not probable that such a complicated proportion as 0·78 was really used, the nearest simple proportion $\frac{3}{4}$ is what I consider to have been really what the architect meant to use. I therefore set this down as the horizontal proportion, for the position of the bosses, between their distance apart, and the width of the panel wherein they are placed.

Similarly from the table in Appendix IV regarding distances of the boss below the top of the panel, to which the vertical position of the bosses appear to be proportioned, it is seen that the average proportion is 0·31 of the distance from the springing to the top of the panelled recess, and as such a very complex proportion is not likely to have been used, I consider that the real proportion intended by the architect was 0·33 or $\frac{1}{3}d$.

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It is worthy of note that as regards both the horizontal and vertical determinants, the proportions $\frac{3}{4}$ and $\frac{1}{3}$ have actually been used oftener than any more complex ones, while most of the deviations are easily to be accounted for by the inevitable errors of execution and measurement; and though there are some few deviations, see tables, which can scarcely be considered as anything but intentional, these are very few, and the proportions of $\frac{3}{4}$ and $\frac{1}{3}$ differ so slightly (one fiftieth only) from the calculated averages, that there is every justification for regarding these are the proportions legitimately deducible from the Adina Masjid.

I have been unable to arrive at any definite law regarding the sizes of the bosses: some other building may furnish the law or some one into whose hands these notes may fall, may by a happy inspiration discover what I have vainly tortured my brains to determine.

One of the other features, and for beauty not the least important are the bands and cornices; these are also subject to definite laws, and so far as can now be seen are dependant on their heights either above the floor, the plinth, or some main line of battlemented cornice or roof, which cuts off as it were for the purposes of the calculation of the depth of cornice, the portion below such marked general line, and starts the calculation afresh from the new starting point. Some such rule for not indefinitely increasing the depth of the cornice was not only clearly necessary on constructive grounds, æsthetically it was even more necessary not to ignore by overpowering with a large and more important cornice, those main general lines, which it was the object of the architect to draw attention to as marking important constructive features; at the same time, the minor bands, put in as it were to break the too great a vertical blank, where such occur, were not main features, and though they conform to the law, they are not allowed to mark a new starting point for the calculation of the depth of the next higher cornice proper, which by such a procedure would possess no marked distinctive prominence, but be confounded with the less important bands of ornament, and deprive the elevation of *character*, reducing it to the insipidity of a blank wall with mere lines of ornament.

The law as disclosed in the cornices of the outer facade, (and by preference I have taken the west as being the one facing the main road, and therefore more important, and as the one which possesses, in the raised back wall, and in the higher Ladies' Chamber a greater number of bands and cornices in actual existence to enable the law to be deduced, as the one for examination) gives the results which will be seen in the "details of proportions of cornices and bands in Appendix IV. It is there seen that each band or cornice is in depth made equal to just a fourth of its

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height from what I for convenience, call its zero of measurement; this zero being as before said, the next lower feature which for constructive reasons, it was an object with the arhitect to bring into prominence.

The law however does not hold in the interior facade nor in the interior cornices of domes, which appear to follow laws somewhat different, as however there are not enough of such various cornices to institute comparisons to deduce any law, and as the slope of the floor of the Masjid will vitiate any single calculation, it has been found impossible deduce definite laws for them.

Another law which governs the main cornices appears to be their division into 3 principal friezes. The minor bands have not these three friezes but less.

The friezes are proportioned as follows, of the total depth of cornice, the lowest frieze occupies $\frac{1}{3}$, the second frieze $\frac{1}{10}$, the third frieze $\frac{1}{7}$; topmost member above the friezes, consisting of mouldings is $\frac{1}{10}$, the principal ovolos are $\frac{1}{20}$.

I have not been able to think of and successfully investigate any other laws that may regulate other features not yet noticed, or other laws which may hold in the features already noticed.

A few words are necessary regarding the unit of measure employed by the architect in his design. It is scarcely necessary to go into an elaborate argument to maintain what will be admitted at once without any argument that the cubit, that universal Indian unit of linear measure must have been used; the only question is as to the length of the cubit used.

Prinsep gives a long list of the lengths of the cubit at various periods and in various places in India, I have tried all the likely measures, and find that the Bagdad cubit of $18\frac{3}{4}$ inches is the only one which gives results which agree fairly well with actual measurements, *and at the same time* gives the measures in such likely round figures as is given by no other measure. Nor is there any prima facie improbability in the use of the Bagdad cubit if it be remembered that shortly before the time the Masjid was started (A. D. 1360, it was finished in 1369) many learned men, architects among them no doubt, were driven out of Bagdad on the sack of Bagdad and the overthrow of the Khalifate in 1258 A.D. by Hulakû, and scattered into all surrounding Muhammadan Kingdoms, and that it is quite possible, indeed more than possible, probable, that the architect selected would be one, who, as having learned his art from a Master from the seat of the Khalifate Bagdad, possessed the prestige which necessarily attached to this circumstance. It must not also be forgotten, that the throne of Bengal was itself filled for a time, at no distant period, by a dynasty whose founder came from Bagdad.

It is the double coincidence that gives me confidence to put forward the cubit of 18¾ inches as the measure most probably used. I am quite aware that when the unit of measure is but 18″ or 19″, the discrepancies between the actual and the calculated dimensions *cannot* exceed 9 or 9½ inches, but it is a very different and a very much more difficult matter not only to get the variations more or less 6 inches, but *also to get with the measure such likely round figures as prima facie commend themselves to us as the ones which any architect with reasonable freedom would be likely to adopt :* take the main outer dimensions 516′ for length and 313 feet for breadth, 18¾″ gives the measure in cubits as 330 and 200 cubits respectively with a maximum difference between calculated and actual measures of only 6 inches, the differences of even ⅛ inch in the unit would throw the round numbers hopelessly out ; take again another principal feature, the clear span of the great nave inside, as well as its total breadth across including its wall, and we get 21 and 30 cubits respectively, with a discrepancy of 1¼ and 3″ respectively, take another great feature the great block rising sheer up with the main great arch in it, the breadth across is 33 cubits and the height 44 cubits with an error of 7″ and nil respectively ; even in the basis of composition of the Masjid (see infra) the basis of the plan is the circle of 77½ feet or 50 cubits while the larger central circle of 103⅓ feet corresponds to 66 cubits and the smaller for the minor cloisters to 33 cubits. In the elevation the basis of the composition the circle of 32¼ feet in diameter corresponds to 21 cubits. For a detail of many of the principal dimensions, with their equivalents in cubits see appendix.

At the present stage of research into the laws that governed Muhammadan architecture, it appears to me desirable to notice and record all obvious proportions between the various parts of the building whether in details or in the basis of composition ; not that I consider that every such proportion must turn out to be a law, but that in my opinion, (and I believe it is the opinion of all who enter into the professional study of a new science, with the wholesome diffidence of earnest inquirers), the science of architecture as practised by the great Mahammadan architects in India is not in such a state of advancement as to enable earnest students to pronounce ex-cathedra what may and what may not be laws, and the record now made may be of use in future. The proportions of various details will be found elsewhere in the body of the report and in the appendices ; here I propose to record only the remarkable proportions which seem to hold in the composition of the design.

A plain oblong rectangular building, with a plain oblong rectangular open court within it, and with plain straight lined facades, is necessarily very simple in the composition and arrange-

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ment of its main dimensions and outlines. It will be seen (pl. 88) that the plan is based on a series of 4 circles (or squares), 77½ feet in diameter each, ranged, two on each side of a central circle of one and one-third their size, for the Masjid proper.; of a series of 10 circles 51½ feet in diameter for the East series of cloisters and half that number on each side, for the North and South wings. In elevation it will be seen also that the elevation of the East facade remembering that the corner towers are not towers that project beyond the face of the building, is filled in by a series of 16 circles 32¼ feet in diameter, and those of the North and South faces by 10 each (not shewn in the plate) while the West facade, which is lower, is filled in by a series of 8-circles or squares of a somewhat smaller size, 28⅔ feet, on each side of a central circle (or square) of twice their diameter. The facade on the inner or courtyard face of the West range, is equally simple, being (leaving out the North and South wings), simply a series of 5 circles or squares of the same size as in the other elevation that is 32¼ feet in diameter on each side of a circle of 2⅔ their diameter.

The largest circle which enters into the composition of the building, is the one which embraces the great central nave, this it will be seen is 103⅓ feet in diameter, that is 1⅓ times the diameter of the side circles (which are 77½ feet across) and as nearly as practically possible, twice the diameter of the smallest circles 51½ feet, which enter into the composition of the plan of the subordinate cloisters, while the circles 77½ feet in diameter which compose the Masjid proper are just 1½ times the size of those that make up the cloisters.

In elevation the great circle composing the central block of the nave is 2⅔ times (that is twice the 1⅓ times of the plan), the diameter of the circles that compose the wings, and just three times the size of the smallest circles which enter into the composition of the elevation.

Naturally with such a simple, and it may be said hopelessly tame composition, the beauty which comes of bold reliefs, and variety in outline, is out of the question; and although the architect has done his very utmost, to partially relieve this, by elaborately ornamented cornices, and panelled niches; these, at the distance, at which alone the whole facade of the building can be taken in by the eye at once, sink into insignificance: the long lines of battlements and the series of domes, of which the pinnacles would be visible, relieving the skyline; and the long series of lattices in the North, South and East facades, and of the arches in the inner facades, alone saving the building, from the oppressive monotony, of looking like a jail inclosure.

The West face does not however enjoy the whole of even these slight advantages, and although the bold projection and variety, introduced by the Ladies projecting chamber, and its attached open vertibule, materially improves the appearance of the North half of the facade, the South half must always look drearily flat and monotonous. Notwithstanding that this is the back facade of the Masjid proper, and therefore more important than the facade of the East face and as such built of stone instead of brick and more profusely adorned than the East face.

On the whole, although the architect has done his very best to produce a good effect, by the profuse use of ornament, his efforts have been all but futile; and it would be difficult to find a building, which, costing as much as this one must have done, produces less effect, at the distance, at which alone, the whole of its vast size can be taken in by the eye. A building, built on the same lines and principles, but of one-fourth the size or less, would it appears to me, produce a greatly more pleasing effect; as the shorter distance, at which as a whole, it could be seen, would enable the details of ornament, in niches and cornices, to be visible, and to produce the effect, which their really beautiful forms and disposition are well calculated to do.

What that acute critical genius the late James Fergusson has somewhere said in regard to the Kutab Masjid may be applied to this, that it would be difficult to use such a profusion of ornament as is here used with so little effect.

But let not injustice be done to the architect. He had a hopeless task before him. A Masjid is but the expression in stone of the spirit of the religion which gave it birth: the severe monotheism of its worship, the uncompromising iconoclasm of its teaching and more than all, the universal political equality of its votaries, are only appropriately expressed in the straight lined square angled outlines of its temple, in the absence of symbolism in its composition, its forms and its sculpture, and in the universal dead level of monotony of its facade, while if the simile be extended somewhat, the overpowering and æsthetically intolerable prominence of its main central prayer vault, but typifies, remotely though it be, the obtrusively self assertive unapproachable elevation of the Muhammadan God and of his friend the Prophet. That to Muhammadan eyes, the buildings must have been beautiful, who can doubt who has read the enthusiastic descriptions of the Masjid of Alauddin in Delhi by the famous Amir Khousrou in his Tarikh Alai and of other writers? But tastes as well as faiths differ.

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Art in the Adina Masjid is represented by sculpture and coloring. I say coloring because the colored borderings and friezes can scarcely be called painting in its higher sense. The sculpture may at the outset be divided into two broad divisions pre-Muhammadan, and post-Muhammadan: the former comprising certain sculptures represented in plates 26, 27, 35, 37, 38, 39, 49, 52, 53, 64, 75, 79; in the elaborately sculptured door frames (of which unfortunately there are no photographs or detailed plates); and in photographs plates 93, 95, besides occasional pieces in other plates: the latter in all the other plates, figures, and photographs representing the subject of sculpture except plate 108 which is a photograph of some sculpture in Buddha Gaya, introduced for purposes of comparison.

Of the Hindu sculpture, the most striking and superb is beyond question the trefoil arch and pillars of the main prayer niche; nothing can exceed the richness of the flowing curves of scroll work. Beginning with the pillars which stand on bases ornamented only by deep mouldings, the richness of the sculpture gradually increases till it culminates in the inimitable Lion's head at the apex of the great trefoil; yet how graduated the increase! The base proper is quite devoid of floral ornament, but the deeply sunk lines of rich mouldings have a beauty of their own and enhance by their simple lines, the richness of the floral work above; the lowest few inches of the shaft is quite plain, over it comes the attached Kumbha base; I call it an attached base, because it partakes of the characters both of shaft and of base: being never found separate, but always in one piece with the rest of the shaft, it can scarcely be called a base, and yet its character is sufficiently distinct to form a distinct subdivision of the shaft: this is a peculiarity of Indian pillars to which architects have not given the attention it merits, for herein if any where is to be found one main difference between eastern and western pillars; the base mouldings of Greek and Roman or even gothic pillars are poor and quite unsuitable representatives of the Kumbha base; to understand the Kumbha base and the moulded base proper of Indian pillars, we must go back not to imaginary Greek influences and ideas, but to Assyria and Persepolis.

Fergusson in his work on the palaces of Nineveh and Persepolis, has given two drawings of pillars of the Persepolitan style of architecture, and it is difficult from his drawings to educe the Indian Kumbha base. I began in my younger days

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by looking on Dr. James Fergusson as a very high authority on architecture in general and the highest on Indian and Eastern architecture in particular; subsequent knowledge has I fear much modified my views. I still look on him as a genius in architectural *criticism*, for who but a man with inborn genius could, without regular professional training or a day's practice as a professional architect, (in the words of Mr. Growse one who has "never ventured to do anything" himself "as a practical architect, but" who has "wisely kept to the safer role of critic") have written the voluminous criticisms on architecture that he has? But I cannot avoid perceiving, and I do so with regret, for one is always sorry to demolish ones idols, that however great as a *critic*, as an *authority*, he should have little weight; and I fully endorse, (though the remark is made in the field of Assyrian architecture with which I am not familiar), Mr. Loftuss' (Chaldea and Susiana) well deserved rebuke to him, for ignoring in the face of irrefutable evidence, facts which go counter to his theories. But I will not confine myself to one example; his books, whether the Palaces of Nineveh and Persepolis or the more pretentions "Tree and Serpent worship" or the "Indian and Eastern architecture" or any other that may be chosen; contain the startling assertion, that the evidence of publicly exhibited genuine inscriptions, (whose genuineness he himself never dares to question,) might be impugned whenever such inscriptions run counter to conclusions derived by him from that vague thing which he calls "style" of architecture, a thing which he never, in any single passage of all his voluminous writings, (and I think in my original admiration of him I have read them all) ventures to define!

It may be thought that in thus attacking Dr. Fergusson (who by the way; and I am really sorry for it; is now no longer alive) I am going out of my way *wantonly*; it is not so; I am contending for a *principle*; the principle that chronology and history, shall as far as may be, depend on the evidence of reliable records: such as the writings of contemporary historians, and more guardedly those of later ones; but above all on contemporary *public inscriptions which cannot lie* and in a minor degree on coins and copper plates, which do occasionally though very rarely mislead; and I am really attacking not him but the most prominent exponent of the vicious principle persistently and pertinaciously enunciated and maintained by Dr. Fergusson, that the *ipse dixit* of an *expert* based on a vague thing which as regards Indian architecture has never yet been defined, but which has been, loosely named "style" (to the mystification of would be earnest inquirers) is to override engraved lithic or other contemporary evidence. For 15 years more or less I have

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floundered in this mystification introduced by him and others into Egyptian, Assyrian and Indian Chronology, in which but for the later volumes of Cunningham and my personal intercourse with him, I might have, as regards India, been floundering to my dying day. It is a duty I owe to the Government which pays me, and to the public, should these lines chance to be published, that my little effort should be freely given to break this Armida ring, which would constrain earnest inquirers (except those of the highest genius, and I am not one of them unfortunately) to accept the ipse dixit of these experts without verification; at the peril of being excluded from the charmed circle in case of dissent.

A comparison of the forms of arches, of the pillars, of the ornamentation, and of the forms of the curves of scroll work, in what I call the Hindu sculptures in the Adina Masjid with the forms and details of plate 108 (sculptures from the Temple at Buddha Gaya), will shew that they cannot belong to periods far distant; but Fergusson in the teeth of evidence from inscriptions and records has arrived at the conclusion that the details of ornamentation and various parts of the Temple date to the 14th century (Indian and Eastern architecture) from the evidence of the vague thing he calls style; in short he has practically carried out his maxim that the evidence of style should in his hands override every other evidence; I cannot possibly allow such a vicious theory to pass unchallenged here, as to do so, would be to bring down the date of the Adina sculptures to the 14th century or thereabouts, therefore post-Muhammadan. And before proceeding further, it was necessary for me to denounce, in a forcible and convincing way a theory which can lead to such a result.

But to revert; if instead of Fergusson's drawings, we consult the original authorities. Le Brun, Flandin, Loftus (and others to whom I have not had access) or that easily procurable, and very generally valuable work "Rawlinson's Monarchies," we shall find that besides the pillars whose bases splay out, there are others whose bases have a distinct, though very slight *contraction*, producing the form of a bell with a slightly constricted throat; and others still, with what is almost a flattened ball shape; these are the direct ancestors of their Indian prototypes the pillars with the pear or vase shaped bases (and capitals) to be seen in ancient Indian architecture; specimens of which may be seen in the little pillars separating the 3 beams of the "Toran" in Cunningham's Bharhut, and elsewhere; from these vase bases, and indeed from the constricted bells, the transition to the Kumbha bases is simple and natural as may be seen illustrated in the case of capitals in Cunningham's volumes.

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Whoever studies plates 22, 27, 29, vol. X Cunningham's reports, cannot fail to see the gradual evolution, from the constricted bell capital, of the usual Indian Kumbha capital; I have mentioned only the plates in vol. X as giving the clue, but to follow every step of the change, many plates which it would be tedious to enumerate, in his 22 volumes must be consulted. The *idea* is not mine but Cunningham's, I only apply to pillar bases what he has so successfully applied to their capitals, and in so doing shewn me my way.

That the origin of these Indian Kumbha bases is to be found in the pillars with the rounded bases standing on two steps, is proved by the Bharhut and the Buddha Gaya sculptures where almost every pillar represented in sculpture is either baseless or has the flattened ball base with an *octagonal* shaft rising out of it. The rectangular steps on which the ball base rests in the more ancient sculpture have become improved into the ornate rectangular bases proper, divided into two members by a very deep moulding; while the ball bases have been improved into the Kumbha *attached bases* and profusely ornamented by what Cunningham calls " turn-overs " which about the 7th century took the shape of sprays of fanciful drooping leaves and flowers of a highly ornate type. As an additional ornamentation on these drooping leaves and bunches, the Hindu pillars at Adina shew upright triangular leaflets, corresponding to the triangular undeveloped embryo leaves which envelop such upright shooting stems as the aloe for instance, out of a cluster of which, themselves beautifully ornamented, rises the smooth octagonal plain shaft proper of the pillar, bound at about three-fourths of its height by an ornamental cincture in relief, from which hang rows of strings of pearls; (pearls are conventionally so represented in Indian sculpture, as may be ascertained by inquiry from any well informed native Indian Master mason) and surmounted first by the Kumbha capital and finally by the cruciform sur-capital, these last two being the Indian prototypes of the Persepolitan bell capital, and the double animal capital respectively.

Over this cruciform sur-capital comes the Magar, scarcely recognisable now; but compare it with the Magars in plate IX Bharhut Stupa, in which latter shorten the lower jaw and the tongue, and elongate the upper jaw and its turned up snout, twist the tail into the half trefoil shape, ornament each scale, and fill the eyes, the ears, and the great bulky projecting head with fanciful floral curves, exaggerating each of these features and making each wrinkle into a graceful scroll; and the exquisite scroll ornament surmounting the cruciform sur-capital is the result: Now finally lead the tails of the two Magars (which form the trefoil) into the mouth of a Lion, the Lion's

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head being ornamented precisely as the Magars' heads have been, each wrinkle expanded into agraceful sunk curve, each hair into an exquisite relief scroll, the eyes, the nose, the ears, each undergoing the floral transformation, and we have as a final result the inimitable trefoil of the great prayer niche of the Adina Masjid with its exquisitety free flowing curves of scroll work.

I am writing with an enlarged photographic print (20 × 15) of the trefoil before me, but I have only one copy of this superb enlargement, executed in London from my photograph at my private cost. Plate 95, will with a good magnifier shew most of the details which I am writing about.

Should the Government however wish to have the enlarged copies of this truly superb work of art, I shall gladly authorise Mr. G. W. Austen, photographic artist, 69, Queen's Road, Finsbury Park, to let the Government have as many copies as necessary, on payment of his charges, the negative my property being still with him: A strict order of the Director-General debars me from paying more than Rupees 4 per negative and annas 4 (about threepence or rather less) per print of the size of 10 × 8; as my single print, alone, taken be it remembered from my own negative, has cost me a guinea in England, it is clear, I could not without disobedience of the distinct and re-iterated orders of the Director-General, procure for the Government copies of my photographs of this superb piece of sculpture, the finest certainly in Bengal.

If after having obeyed orders, I may be permitted to express my views. I would respectfully represent, that it does not appear to me, that the true interests either of art or of the Government (which is spending several thousand rupees annually for the adequate illustration and record of Indian Art as one of the objects of the archœological survey), is advanced by tying down an officer who can be trusted with the all but independent conduct of the survey of two Provinces, with such hard fast and narrow rules, as that which has prevented me from including a proper photograph of this superb work of art among the one hundred and eleven plates which illustrate this report.

Besides this piece of Hindu sculpture, the main prayer niche has other Hindu sculptures, notably the pilasters used as an architrave over the rectangular framing, within which the niche is cut, and just under the long inscription over the niche; there appear to have been used for the architrave three pilasters of rich workmanship with very distinct Kumbha bases and capitals. There are besides, some minor sculptures, shewn in plates 48 fig. 23, 52 fig. 18 pl. 53 figs. 9, pl. 23; (the figures shewing by a reference to index plate, 25 the positions of the sculptures on the prayer

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niche; fig. 16 plate 49 may also be Hindu, though comparing it with fig 9 plate 53 the comparatively formal stiffness of the lines of the shoot within the niche, as well as the form of the niche (a cinquefoil one) leads me to doubt its having been originally Hindu and to regard it as a Muhammadan imitation of Hindu work.

The Hindu execution of fig. 9 is shewn not only by the freedom of the curves of the foliage and tendrils of the fanciful flower shoot within the garland, but conclusively beyond cavil, by the bells and half lotus-bosses from which the garlands and bells hang; the garland or festoon appears to me, if the instinct of intelligent native Hindu masons be not unworthy of consideration in their knowledge of the conventional modes of representing objects in Indian art, to consist of a string of pearls for the innermost garland, followed by a garland of the common Indian marigold petals (a flower universally used in offerings by Hindus), with an outermost garland of coral; the bell and the lotus speak for themselves. Fig. 23 plate 53 shews interlaced garlands of the lotus *stalk*, and coral, hung from the mouths of the grotesque conventional Indian Lion's head (only half the Lion's head is shewn in the plate) with an upper border of gold amulets precisely like those made and worn to this day by those who can afford such expensive jewellery: fig. 28 pl. 48 represents a jewel of gold set with precious stone, it is a jewel almost always seen on the chests of Jaina figures and in the head dresses of Hindu and Buddhist figures, and is even now used by rich Hindu females as an adornment for their hair at the forehead.

The row of flat plain battlements fig. 9 plate 53 is apparently Muhammadan, replacing probably a freize of human figures destroyed by the iconoclastic Muhammadans.

Compared with the freely flowing lines of these Hindu sculptures detailed above, the Muhammadan sculpture illustrated in plates 40 to 52 and in plate 54 which give the sculptures of the main prayer niche, though in themselves beautiful, and such as would command admiration any where else, are utterly dwarfed and overshadowed: their lines appear too formal, the curves stiff, their endless repitition monotonous, their execution shallow and their smoothness coarse, beside the deep cut lines, polished rounded surfaces, and flowing forms, of the earlier work; and yet not many Muhammadan sculptures are any where executed with such smoothness as these, in so hard a material as blue black basalt; and few will deny the chaste beauty of the diamond and circle bordering figure 2 plate 40, the beauty of the interlaced floral borderings of figure 5 plate 40, figure 3 plate 42, figures 13 and 14 plate 50 or the flowing grace of the scroll and flower borderings in figure 1 plate 41, figures 4 and 10 plate 43

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or of the fringe, figure 16 plate 49; while for filling in of larger surfaces, the geometrical patterns, figure 12 plate 44 or the floral patterns figure 6 plate 45, figure 7 plate 48, are above the average even of good Muhammadan work. The lamps sculptured, represented in figures 8 and 11 plates 46 and 47 I considered censers till Mr. J. H. Wilson, late Superintending Engineer, Western Circle, drew my attention to the distinct lines of flame in the triangular jets over the middle of their upper edges and quoted the passage of the Quran which compares Allah to the bright flame of a lamp, set in a niche, (and these are sculptured within the octagon of the prayer niche hollow.) With their chains and pendents, the lamps are appropriate ornaments of the prayer niche, and are not without beauty, but I hardly think, judging from the rude remains of lamps of metal dug up in the ruins, that they represented the lamps actually used in the aisles of the Masjid, though the lamps used in the main nave, and possibly made of silver, may have resembled the sculptured ones.

Plate 54 is an impression, taken before its disappearance; of the gold stone set as stated in page 23 supra at F. (plates 12 and 94) over the main prayar niche; it is important, as it contains the fish emblem, and it is fortunate, that at the instance of Mr. J. H. Wilson, after erecting scaffolding te reach this stone, I felt and examined it closely, and am able to furnish a mechanical impression of it; the emblem in the centre of the niche was clearly a fish, the very scales, much worn (they have not come out consequently in the impression) were there, and both Mr. Wilson and I were perfectly satisfied that the sculpture was a fish.

In an earlier page, a conjecture was put forward that the architect of this Masjid a was scholar of a Bagdad master architect, and this piece of sculpture supports the conjecture. The fish was a well known and frequently used emblem in Chaldean Babylonian and Assyrian mythology, and even passed into the, cuneiform Heiroglyphic for fish as five of the arrow headed strokes ranged roughly into the outline of a fish. See Rawlinson, Duncker, Ragozin for various versions of the worship and symbolism of the Fish God, Oannes, Nin Ninip, &c. The persistence of myths is well known, but even more fully established is the greater persistency of symbols; and the fact of the fish being a well known symbol in old Babylonia would secure its continuance even under altered meanings in the same country though various changes of its religion down even to the Khalifate. Its occurrence in the Adina Masjid concurrently with the use of the Bagdad cubit is at least remarkable, and may well excuse, until evidence as strong is forthcoming to the contrary, the supposition, hazarded in page 61 supra, that a Bagdad architect or a pupil of a Bagdad architect was the designer of the Adina Maisjd.

The inscription round the border of the stone is given in Ravenshaw's Gaur with its translation, its position may be seen in plates 12 and 94 at F.

The full triangle and 2 half triangles over the centre and ends of the prayer niche are probably intended as a sort of finish to the niche panel, they are plain, quite unsuited to the profusion of ornamental work below, and appear to me wholly unmeaning. The triangle over the inscribed fish panel appears to me to be a monogram, though I cannot read it, see also plate 12.

Before passing from the central prayer niche and the sculptures in the central section of the back wall of the vault, it is necessary to note, that over the head of the Magar (plate 95) disguised as above stated by a profusion of fanciful floral scroll work, there is a plain flat object resembling an urn holding a three-lobed flower. This object is so utterly out of keeping with its environment, that it is easy to perceive, even if its form did not proclaim the fact, that it is the Muhammadan architect's alteration of some idolatrous image which his iconoclastic spirit could not tolerate; comparing plate 95 with plate 108, (Buddha Gaya sculpture,) it is seen at once that over the heads of the Magars must have stood sculptures of some living objects, (probably of Ganga, with a corresponding one of the Jamna on the other side of the niche) in the usual conventional human form; whether the figures were of Ganga and Jamna or of other divinities in human form, or one of the sacred animals, they would be equally intolerable to Muhammadans and were accordingly chiselled off and replaced by the existing wholly unmeaning vases. As the figures of the Magar and of the Lion's head, had they been recognised by the Muhammadans would have also been destroyed, I am inclined to think, bearing in mind their very effective floral disguise, that the architect failed to recognise them, and taking them to be mere ornamental scroll work permitted them to remain both in the trefoil and in the rows of garlands already noticed.

Next to the great prayer niche, the most important piece of Hindu sculpture, even more important than the existing sculptured Hindu doorways, is the sculpture inserted in the prayer niche Z. plate 24 and shewn in plate 93. That this was clearly Hindu is so obvious that discussion to establish its Hindu origin is superfluous; but it is not only a piece of original Hindu work, it appears to me to be a complete Hindu doorway or entrance, transferred from one of the subordinate temples which no doubt once clustered round the great main temple of Aditya Sena!

The two pillars which support the trefoil appear to me, comparing them with the corresponding pillars in the main prayer inche to have been either slightly shifted forwards and closer to

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each other or to have belonged to some other place and to have been put in here by the Muhammadans, probably the former: but behind the pillars, and seen somewhat dimly in shadow in the gap between the pillars and the plain wall on their outer sides, are a number of sculptures which not only establish the fact of this having been an entrance doorway (from the figures of the Dwarapalas or perhaps of subordinate divinities placed in niches at the lower parts of the jambs,) but further assign an inferior limit to the age of the temple to which it belonged by the evidence of the figures projecting to the right and left respectively from the right and left sides of the right and left pillars near their capitals: no instance that I can now call to mind, occurs of this custom in buildings later than the 7th century: the figures are defaced and covered with mortar, which from the awkward position of the sculpture I could not clear away sufficiently to enable me to identify them; but probably, (as Cunningham in other examples pointed out for the first time,) they were figures of Ganges and Jamna, and conclusively fix the inferior limit to their age as the 7th ceutury A. D.

These figures the architect originally hid away by thin slabs of stone, one of which I found already fallen out, and the other being loose, I pulled it out to confirm the partial evidence of the other.

But over and above the inferior limit to the age furnished by this most important Hindu remnant, this doorway furnishes an outline of the sort of roof used at the time it was executed; and we see from this, that the tall towering Sikhara had not yet come into general use, at least not in Hindu temple-architecture in this part of India. We know from the evidence of the Buddha Gaya temple that it had been in use many years previously for Buddhist Temples, but I am not aware of any originally Hindu (not converted Buddhist) temple of this early age the 7th century, with a tall Sikhara roof; and the absence of the Amalaka ornament so frequent in ruins of Hindu temples is some confirmation of my inference.

It is possible that the great central temple had a Sikhara, and that this doorway belonging to only a subordinate temple, gives a representation of the mode of roofing such temples only. Further investigation elsewhere can alone settle this question: what this sculpture teaches is, that the smaller temples not only had their roofs in receding steps, (5 are seen here but there may have been other steps higher up destroyed by the Muhammadans) but also that the plan of the temples in external outline was a square of which each face presented a large central projecting facet, flanked on each side by 2 smaller successively receding facets, a form which continued common enough for many years subsequent to the 7th century A. D. The beautiful temples in the salt range have already familiarised us with the frequent if not invariable use there of the trefoil in Hindu architecture, about this period; the sculptures in basalt of Purnna Varmma in Buddha Gaya prove its common use in the 7th century in Magadha, and now these trefoils prove that in Bengal also their use was neither unknown nor uncommon: in brief; that in Northern India, as late as the 6th or 7th centuries, the trefoil arch was used in temple architecture.

The lozenge and rosette ornament running along the innermost curve of the trefoil is a well known and common Hindu bordering; and represents if the traditions of modern Hindu masons be worth any thing, a border of gold brocade.

Confirmation of this is here furnished in the graceful fringe which hangs from the same bordering on the lines of receding stepped roof; they obviously represent the gold thread and silk twisted fringe which is frequently attached to brocade.

The central ornament of the pinnacle is the usual conventional lion peeping out of the conventional cave, while from his mouth hangs a panchlahri (five stringed garland) down to a second and larger Lion's head who peeps out from a second larger cave and from whose mouth flows forth the brocade bordering of the trefoil arch.

It is necessary I think to point out distinctly, for it has not before been done, that these two horse shoe shaped objects one over the other, whence project out the Lion's heads, are the conventional Hindu representations of rock cut caves: the ornament here represents a cave of two storeys; elsewhere may be seen caves of 3, 4, 5 or more tiers, while the earlier freizes. capitals and other plain borderings are invariably and frequently ornamented with representations of these caves. So many various names have been given to this object, and its origin and intention have been so often misrepresented, misconcieved, and even its form, through misconception of what it really represents, has been so often modified accordingly, that it is not superfluous to point out what it really is. One has only carefully to look at the great cave facades in Fergusson's folio works, in his and Burgess' cave temples of India, and elsewhere where Indian caves with the horse shoe roofs are represented, to need no further evidence, that this and no other is the object sought to be conventionally represented by all such horse shoe niches wherever occurring. Some identifications are so palpably obvious, that one has merely to point them out; they need no elaborate proof, to insure their immediate acceptance; and this is one of those.

Passing on now to the side prayer niche in the great vault, it is to be noted that the following appear Hindu. Plate 26 fig.

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9 where the bell (seen only in halves at the 2 margins) conventionally and fancifully represented, stamps this running fringe of pearl garland and bells hung with coral chains, as Hindu; it is worthy of note that the flower and stalk represented within the garland has leaves and tendrils unsymmetrically arranged yet balancing each other in a way foreign to the regular symmetry of Muhammadan patterns.

(Plate 27) fig. 30 appears to me Hindu, and although the running horizontal border below, is undoubtedly Muhammadan the awkward curve joining the upper trefoil and volute to the border, leads me to suppose that originally, in the Hindu work, from the position it occupied (see plates 25 and 96) it must have formed the tail of the Magar whose turned up snout here faced the Hindu trefoil, and I consider that with their usual iconoclastic zeal the Muhammadans, recognising the animal, chiselled away its snout and body; and carved their own comparatively formal and certainly monotonous running border to replace it: the existence of the little tongue, just below the springing line of the Muhammadan cinquefoil arch confirms my supposition; of course as the corrollary to my supposition, the cinquefoil arch must be Muhammadan, which is almost certain judging from its bordering see fig. 31 plate 34.

I cannot with such abundanceof evidence before my eyes as is furnished by the plates of sculpture which accompany the report, and others which I have considered superfluous to submit (though the material is in my possession) admit the supposition that the beautiful scroll work exquisitely balanced on the whole, yet charmingly unsymmetrical in its details, can be the work of the sculptors who produced the totally different *class* of monotonously regular and painfully symmetrical sculptures which from their shallow depth of execution must be stamped even by unæsthetic and untrained eyes, as the work of sculptors of a wholly different school; even where they have tried to imitate the work of the other school as in the running border fig. 20 plate 29 for an example or fig. 11 plate 35, the result is a signal failure, the curves being too formal; (plate 35) fig. 10 is also Hindu as is proved by the yak Chaunris (fly flappers) and bell hung from the bordering of the garland of pearls by strings of coral; the two pods with their seeds shewing through, might help to fix the plant intended to be represented, it assuredly is not the poppy, but what it is I am unable to conjecture.

(Plate 37) fig. 26, and (plate 38) fig. 33 are so palpably stamped Hindu by the yak tail Chaunries and bells, that were other more prominent examples wanting, the charming want of geometric symmetry in the filling of their garlands might alone serve as a criterion to distinguish Hindu from Muhammadan work.

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Of the rest of the plates which illustrate the sculpture, almost all are clearly Muhammadan work; I do not for a moment mean to assert that they are not beautiful specimens of arabesque ornament, all I mean to assert, and which I have said enough now to clearly point out, not to artists or experts, but to others (for I have a hope that the report will some day come to be published) is, that there is an *essential* difference in the *spirit* of the two sculptures Hindu and Muhammadan; the one wholly irregular in detail yet as a whole well balanced, permitting a freedom of fancy and a flow of curve, which it was simply hopeless to attain with the symmetrical and therefore necessarily more formal lines of the other; charming from its very wantonness, yet unsurpassed *as a whole* in balance, by the most rigid of the geometrically correct lines of the other. The one an expression of free *genuis*, the other an outcome of a shackled *industry*.

Little further needs to be added, plates 56 to 64 represent the sculptures or more properly arabesques from the so called pulpit, among which only figs. 6, 7, plate 64 appear to be Hindu. For some Hindu sculpture concealed by the architect turning the sculptured face of the stone inwards, and now exposed see Ravenshaw plates 40, 41; plate 64 of the illustrations accompanying this report; and Cunningham vol. XV.

Plates 66 to 87 represent sculptures from the Ladies' platform or gallery. Among these, fig. plate 79 is a modified Hindu sculpture, representing the roof of a temple in 5 receding steps, as in plate 93, with turned up corners and crowned by an Amalaka; the trefoil is a Hindu trefoil from its proportions, but in place of the figure of the god or goddess which it once inshrined, is now carved a lamp or censer.

Fig. G plate 75 a running border of diamonds and lotuses, appears Hindu; the panel inside, which once probably inshrined a Hindu figure is now cut into a cinquefoil cusped arch, with a censer or lamp inside.

In conclusion I may add that the lettering or numbering of the figures in these plates is meant to indicate the positions the figures occupy in the various niches: plate 25 is the index for plates 26 to 53; the position of plate 54 has been indicated before; plate 55 is the index for plates 56 to 64; plate 65 is the index for plates 66 to 87.

By a reference to the indices the positions of the various sculptures will be seen, the index plates being lettered and numbered to correspond to the lettering and numbering of the figures in the plates.

Jos. D. MELIK BEGLAR.

APPENDIX I.

Detail of method of setting the ornamental bricks in the Adina Masjid.

The domes spring from rows of ornamental bricks set flat with their ends exposed, resting on a freize of bricks set as detailed below for the particular patterns which occur in any particular dome.

Plate I. The mouldings and ornamental parts wherever occuring similar to $a\ b'\ b''\ c\ d\ d'\ f\ f'\ h\ j\ m\ n\ o$ have the bricks set with their beds horizontal, but in the freizes $b\ b',\ b''$ the bricks though set horizontally, present their narrow ends to view, while the others present the longer sides of the bricks to view.

The ornamental chains in the niches are in all cases made of bricks set vertically with their narrow ends exposed to view.

The bosses or censers of various patterns hanging from the chains. The bosses in the spandrils, as well as the ornamental battlements, over the niches and their vertical divisions, whether plain or ornamental, separating the battlements, (and to be seen in plate VIII) though of varying shapes; as also the central ornament of this line of battlements wherever occurring, are in all instances made of bricks specially moulded for their places and placed vertically.

The broad freize of ornamental festoons or scroll work under the niches wherever occurring, and under the empty pedestals on the West facade, as well as the bordering round the niches, both square and curved portions, are in all cases of bricks set vertically, flat against the wall.

In the freize i in all cases the bricks are placed vertical, but whereas the pillars separating the miniature arches, are of bricks presenting their ends to view, the arched panellings are of bricks set flat up against the wall.

The lattices are, in all cases, made of bricks specially moulded, and set horizontal, with their ends exposed to view.

The little foot pieces at the feet of the various lattices wherever of brick, are of specially moulded large bricks.

In the freize k in all cases the bricks forming the divisions between the panelling are set vertical with their ends exposed to view but the bricks forming the panels are differently set.

The finials g over the niches, though of various shapes are in all cases made of specially moulded brick set with the vertical moulded end in view.

In plate II the mouldings $r\ s$ and similar mouldings wherever occurring, are of brick set horizontally, with their sides exposed to view, as are also all the mouldings, l. dividing the rows of lattice-openings in the latticed windows, though their forms vary in the various lattices, as well as all the lines of moulding at p.

The boss *q* is specially moulded and set vertical against the wall.

In plate V, the lines *t n v w* and similar work wherever occurring are of bricks set horizontally; *t* and *w* so far as can be judged, with their ends exposed to view, the other two with the ornament on their exposed sides.

In plates VIII and XXI, lines *x x′ y z* and similar lines wherever occurring are of bricks set horizontally.

In the central niche (only half is shewn in the drawing) between the 1st and 2nd lines of cornices, the pillars are built of bricks both vertically and horizontally set, the narrow moulding and the moulding separating the two panels into which the shaft is divided being horizontal, while the panels themselves forming the shaft of the pillar are set vertically. The ornamental line E. under the central niche, as well as E.′ in the pedestals (without niches) between the 2nd and 3rd cornices, and E.″ over some of the niches, and similar work wherever occurring, is of brick set horizontally, with their sides exposed to view, while *r r′* set also horizontally expose their ends to view.

The lines *A B D G H J K L M X Y Z* are all laid horizontally, while *F* and *I I′ I I″* and *W* are set flat vertically against the wall, and the corbels *C* as well as the pieces *C′ C″* are specially moulded bricks presenting their moulded ends to view.

The turned up ends N. of the cornices in both plates are of specially moulded large brick bedded horizontally.

The lines *O P Q S T* in the lowest or 1st cornice are all of bricks bedded horizontally and presenting their ornamented sides to view, the forms of ornament in each line is not the same throughout its entire vast length along the facades, but though the forms of ornament cut on the bricks vary, the mode of setting is the same.

The bricks for the freize V. however, varying also in form of ornamentation in different parts of its length, appear to have been moulded and set flat vertically against the wall.

The bases of the pillars and of the vertical bordering of the niches on the external facades wherever any exist, are of bricks specially moulded of a large size and set horizontally.

The freize *U* in plate XXI. consists of vertical pillars of specially moulded and ornamental bricks set with their ends vertical, separating ornamental panels of brick set flat vertically against the wall. The freize surmounting this is simply a modified form of freize *i* of plate I and other plates already above noticed.

In plate XXII. There are no new mouldings, which or rather mouldings corresponding to which in other plates have not already been noticed, except some lines of ornaments at the tops of the latticed niches. These are of bricks set horizontally.

APPENDIX II.

It will be seen that the surface of the floor of the Ladies' platform is divided off into squares by the pillars and beams resting on them; omitting for the purposes of this theoretical calculation for the strength of the supporting beams, the thickness of the pillars on the one hand, diminishing the actual load on the beams, and on the other, the weight of the beam itself, the squares are linear squares touching each other, of 12 feet side; 4 squares meeting each other at their corners over each pillar.

But as the beams extend in pairs from pillar to pillar, it will be seen that by distributing the surface into squares by drawing lines diagonally from pillar to pillar, the surface is divided into squares of exactly half the area of the original squares, 4 squares meeting each other at their corners, not on the centre of each pillar, but at the centre of each of the previous squares, and that each pair of beams running squarely from pillar to pillar supports one of these squares, of which it forms a diagonal; as the former squares have an area of 144 square feet these which are exactly half the size have an area of 72 square feet, or with 5″ flooring slabs, of 30 cubic feet.

The 2 minor beams which rest on the centres of each principal beam in all squares covered by the method of "intersecting squares," have a volume of 4 c. f. each, $\frac{1}{2}$ of which is borne by each beam.

The total volume therefore supported amounts to 34 c. f. or 58 cwt. nearly @ 187 lbs. to the c. f. (see Rankine).

On such a square the live load would probably not exceed 8 women, or say 4 women over each beam, taking each @ $\frac{3}{4}$ cwt. including children, there would have to be added 3 cwt. of live load, equivalent to 6 cwt. of dead load to the previously found 58 cwt. of dead load; a total of 64 cwt. of load, on each beam.

As Engineers allow 8 for a factor of safety for stone, and from the circumstance that these beams have stood out the assults of time, accident, and violence, there is every reason to regard them as really being 8 times stronger than the calculated strength by breaking load would give, the equation stands thus.

$8 \times 64 = 2\,C\,\frac{bd^2}{L}$ where as in the text b is 10″ d 11″ and L is $6\frac{1}{3}'$

which gives the value of C, as 1·3 cwt. for the particular kind of granite used; and as said before, considering that there is justification for regarding 8 as the factor of safety allowed: a value on the face of it probable, and sufficiently reasonable to justify acceptance.

The beam it will be seen has been assumed to be loose at the end, for as the beams rest on the corbels which jut out, not from the centre, but from the edges of the abacus, their mitred ends can scarcely if at all be pinned down by the upper monolithic fluted columns, while obviously the clear span which ought to be assumed, is the clear space not between the capitals of the pillars, but between the ends of the opposing corbelled supports.

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APPENDIX III.

Details of Forces—

Direct crushing force on walls at plinth average	3·8	tons per. sq.	ft.
Direct at foundations ...	3·45	„	„
On square bases of pillars ordinary	1·65	„	„
„ „ tall ones ...	1·7	„	„
„ base of round shaft ...	3·6	„	„
„ necks of columns ...	4·6	„	„
„ on ordinary west wall at plinth	1·5	„	„
„ at foundations ...	1·5	nearly	„
„ back wall of nave at plinth	6·2	„	„
„ „ at foundations ...	5·7	„	„
„ abutments at floor ...	4·9	„	„
„ east wall at plinth ...	2·1	„	„
„ piers of nave at floor ...	12·5	„	„
„ piers facing court average at floor west ...	2·25	„	„
„ east ...	4·0	„	„

Thrust of Vault.

Let the full lines in fig 6 plate 88 represent a Section of the vault (it is accurrate, and correctly drawn except the lines *H C H′ C* which are conjectural), it is obvious from this Section and from the form and amplitude of the arch and its backing between the points *C′* (the crown) and *T* that there is no point of rupture between *T* and *C′*, and it is not necessary to go into further complicated details regarding the stability of this part taken in itself, so that for the subsequent calculations, to simplify what is notoriously one of the most laboriously intricate calculations, this portion may be assumed as in itself a stable solid piece.

The weak point of the arch is at once seen to be *T Q* and to insure stability, the forces should be so balanced that the piece *T Q H C C′* should have no tendency to rotate round the points *T* or *Q*.

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Assuming that the thrust at the crown normal to the radial joint $C' R$ acts through the middle third of the voissoir, as it ought to in all well built arches, and for simplicity that it may be supposed to act through P the middle of $C' R$ (any moderate variation in the actual position of the point P will it will be seen not have any great effect on the result, and the alteration of values can be easily made in the equations if desired).

We have for the limiting values of the thrust at P the equations.

$$p.' \times T S = w \times T D \text{ or } p.' = w \frac{T D}{T S}$$

$$p.' \times Q S' = w \times q d' \text{ or } p.' = \frac{w Q D'}{Q S'}$$

where $T S$, $Q S'$ are the perpendiculars on the line of thrust at crown from T and Q respectively and $T D$ $Q D'$ the perpendiculars on the line of action of the weight w of the piece $Q T C' C H$, (which amounts to 6,820 lbs.) acting through its centre of gravity G, and $p.$ and $p.'$ the maximum and minimum values respectively of the normal thrust at the radial joint at the crown; giving the numerical values of the symbols it is found that $p.=$ 5,541 lbs. and $p.' = 1{,}577$ lbs.

The weight which acting on the wedge shaped keystone $R C' R'$ would produce the pressures $p.$ $p.'$ would be $2p.$ Cos. 75 and $2p.'$ Cos. 75 respectively very nearly (75 degrees being the angle very nearly which the direction of the line $P S$ makes with the vertical) or giving their numerical values, the limiting maximum and minimum weights on the crown compatible with theoretical stability would be 2,868 lbs. and 816 lbs. representing respectively 24 and 7 cubic feet of masonry, neither of which are intrinsically of such magnitude that we can on the score of improbability alone reject either, but must consider it as quite within the limits of possibility that the load *may* have amounted to somewhere approaching the maximum limit of 24 cubic feet, while it could not be less than 7 cubic feet. It is needful to remember that the wedge $R C' R'$ is itself alone more than 3 cubic feet, and that it is not without its corresponding weight.

Prolonging the vertical representing the line of action of the weight of the semi arch and its backing to meet the line of thrust at B, it will be seen, that the resultants t t' of the pressures $p.$ $p.'$ and weight w will be given by the equations.

$$t^2 = p^2 + w^2 + 2\, p\, w \text{ Cos. } 75$$
$$\text{and } t'^2 = p'^2 + w^2 + 2 p' w \text{ Cos. } 75$$

whence giving the numerical values, t and t' the maximum and minimum final thrusts compatible with the stability of the arch

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$T\ C'$ are found to be t=9,837 lbs. t'=7,387 lbs. and the angles with they make with the vertical are 33 degrees and 12 degrees respectively. As may have been inferred without calculation, the directions so found pass through the points T and Q.

The force which tends to overturn the piers is found in the two limiting cases from the equations.

$$f=\frac{450\ t\ \text{Sin. } 33^\circ}{12 \times 2240} \qquad f'=\frac{430\ t'\ \text{Sin. } 12^\circ}{12 \times 2240}$$

where f and f' are the maxima and minima moments in foot-tons tending to overturn the piers, and 450 and 430 the leverage (in inches) at which the respective forces act, or the vertical distances of Q and T from the floor of the nave, and 12 and 2240 the divisors needful to convert the inches and lbs. into feet and tons.

Substituting the values of t and t' found above, f and f' are found to be 90 and 24½ foot-tons respectively nearly, which is the force tending to over turn the piers per *foot length* of the vault. The moment of stability of the piers after making the necessary deductions for the open archways, amounts on the average per foot length to 34·5 foot tons.

It is necessary to note that in the above calculations fractions of inches and degrees have been omitted for simplicity, and that the final results are consequently not mathematically accurate, but the accuracy is such as is quite sufficient for the purpose of this investigation and for all practical purposes.

Friction too has been left out of account as well as the tenacity or cohesion of the mortar, as also its compressibility, these working respectively for and against stability, are usually left out in such calculations and help to some extent to neutralise the effects of each other.

The calculations lastly are as is evident, for statical forces, the moments are all statical moments. No dynamical elements have been considered, for the sufficient reason that the instant actual dynamic motion takes place, and dynamic forces claim to enter the calculations the structure as a *stable structure* has ceased to exist.

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APPENDIX IV.

Details of proportions of various features of the Adina Masjid.

Detail of proportions of pillars.

Lower pillars of Ladies' platform, probably Muhammadan—

Height of shaft	... 3	Semidiameters.	
Height of capital	... $\frac{2}{5}$	"	
" " corbel	... $\frac{2}{5}$	"	nearly.
" " base	... $\frac{1}{3}$		
Projection of corbel	... $\frac{2}{5}$	"	"

And in the upper fluted pillars of the Ladies' platform which are probably Muhammadan—

Height of fluted shaft	... 4	Semidiameters.
" " base	... $\frac{3}{4}$	"
" " neck of capital	... $\frac{3}{4}$	"
" " capital	... $1\frac{1}{4}$	"
Diminution of shaft	... $\frac{1}{9}$	"
Breadth of base	... $2\frac{2}{3}$	"
" " capital	... 3	"

In the pillars on the sides of the minor prayer niches as well as those of the Ladies' platform which appear to be all Hindu, the proportions are (the pillars are indented rectangular, the Semidiameter here means the breadth including the projections in the centres of the faces.)

Height of shaft	... 11	Semidiameters.
" " base	... 2	"
" " capital	... 1	"
" " corbelled sur capital	1	"
Breadth of base	... 3	"
" " capital	... $2\frac{1}{2}$	"
" " corbel	... 3	"

In the pillars of the prayer niche N. (see index plate and plate 23) which is certainly Hindu, the proportions are :—

Height of shaft	... $12\frac{1}{4}$	Semidiameters.
" " base	... 2	"
" " Kumbha base or attached base	... 1	"

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APPENDIX VI.—(*Continued.*)

Height of capital with neck...	1	Semidiameters.
Corbelled sur-capital ...	1	„
„ abacus ...	1	„
Breadth of base ...	3	„
„ „ corbelled capital ...	2⅔	„
Diminution of shaft ...	½	„

In the pillars of the main prayer niche the proportions are:—

Base	1¾	Semidiameters.
Sur-base plain part ...	¾	„
Kumbha base	2	„
Neck	1¼	„
Total of shaft including neck and sur-bases	11¾	„
Capital	½	„
Sur-capital or corbel and abacus	¾	„
Breadth of base	3	„
Diminution of shaft ...	½	„

In the pillars of the side prayer niches of vault, the proportions are:—

Base	2	Semidiameters.
Shaft	11½	„
Capital	1	„
Sur-capital	1	„
Breadth of base	3	„
Diminution of shaft	Nil.	

In the upper pillars of the pulpit the proportions are:—

Base	1½	Semidiameters.
Shaft	10	„
Capital	1½	„
Breadth of base	1½	„
Diminution of shaft ...	⅓	„

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DETAILS OF PROPORTIONS OF BOSSES.

Distance between Centres.

Breadth of rectangular panel inclosing arch or opening.	Distance between centres of bosses.	Proportion.	Breadth of rectangular panel inclosing arch or opening.	Distance between centre of Bosses.	Proportion.
49	39	·78	43	35	·82
49	40	·78	36	27	·75
18	13	·76	61	50	·82
61	49	·80	39	32	·88
41	32	·78	49	36	·73
34	29	·85	49	37	·75
50	38	·75	43	33	·77
40	30	·75	50	41	·82
46	36	·78	19	13	·68
83	64	·77			

DETAILS OF PROPORTIONS OF BOSSES.

Distance below upper Line.

Height from spring to top of panel.	Height from centre of boss to top of panel.	Proportion.	
16	5	·31	
15	4½	·30	
60	20	·33	
31	12	·37	
25	5	·20	
26	9	·35	
17	5½	·32	
27	9	·33	
16	5	·31	
47	21	·45	
14	3	·21	
53	13	·25	

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DETAILS OF PROPORTIONS OF CORNICES & BANDS.

Position and Particulars of Cornice or Band.	Height of its lowest member above base mouldings or above the next lower *cornice.*	Thickness or depth of cornice or band.	Proportion of depth of cornice or band to height at which it is placed.
Lowest band West wall on outside	97″	26″	$\frac{1}{4}$ nearly
Main cornice West wall (goes round building) outside ...	198″	50	$\frac{1}{4}$,,
Cornice above main cornice in the raised central portion of back of vault	112″	26	$\frac{1}{4}$,,
Ladies' Chamber band of floor plinth of chamber above base mouldings	83″	22″	$\frac{1}{4}$,,
Main cornice above plinth of chamber	222″	52	$\frac{1}{4}$,,
Inner facade	243″	55	$\frac{1}{4}$,,
Interior cornice below domes ...	240	24	$\frac{1}{10}$,,

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APPENDIX V.

Some of the dimensions of the main features of the Adina Masjid with their equivalents in cubits of 18¾ inches.

Detail of feature.	Cubits of 18¾ inches.	Equivalent in feet or in	Actual dimension.
Total length	330	515ft. 6½″	516 ft.
„ breadth	200	312ft.6in.	313 „
„ Interior Court length	268	418ft 9in	419 „
„ „ „ breadth	119	186ft.	186 „
Breath of Masjid proper	48	905 in.	900 „
Clear span across of nave	21	394 „	393 „
Breadth of nave with its walls	30	563 „	566 „
Span of central great arch	26	487 „	480 „
Breadth of central block including the great arch and its abutments	33	619 „	626 „
Do. do. including the wings	50	937 „	926 „
Height of top of battlements of Masjid proper above plinth at back	18	337½„	333 „
Height of top of first row of battlements of central block above plinth at back ...	27	506 „	500 „
Height of battlements of Masjid proper inner or East face above floor	18	337½„	340 „
Height of topmost battlements of great central nave, front or East face above floor ...	*44	825 „	825 „
Total length including walls Ladies' Chamber...	35	656 „	650 „
Total length Ladies' vestibule	26	489 „	490 „
Height of floor Ladies' Chamber above plinth ...	5	94 „	95 „
Height of floor Ladies' platform above Masjid floor	6	110 „	112 „
Total height of battlements of Ladies' Chamber above *its* floor	18	337 „	333 „
Height of main cornice Masjid proper back, above plinth	16	300 „	298 „
Depth of cornice, total including footing of battlements	3	56 „	60 „
Depth of first ornamental band, exclusive of footing	1	18¾„	19 „
Span of arches in East facade Masjid proper ...	5	94 „	97 „
Span of side arches of great nave ...	6	112½„	113 „
Back wall of nave thickness	7	131 „	123 „
Pulpit total height above floor	11	206 „	209 „
Breadth of pulpit across	4	75 „	72 „
Thickness of wall at back Masjid proper ...	4	75 „	76 „
Diameter of domes in Ladies' platform ...	7	131 „	127 „
„ „ Masjid proper public aisles		131 „	128 „
Clear span of arches Masjid proper			126 „

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* This is the traditional Bais Gaj.

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APPENDIX V—*(continued.)*

Detail of feature.	Cubits of 18¾ inches.	Equivalent in feet or in.	Actual dimension.
Pillar to pillar Centres Masjid proper ...	8	150 in.	153 ft.
Ordinary prayer niches	3	56½,,	56½,,
Diameter of Semicircle of ditto	2	36½,,	37½,,
Diameter of domes of cloisters	6	112½,,	117 ,,
Span of arches cloisters	6	113 ,,	117 ,,
Pillar to pillar centres	8	150 ,,	149 ,,
Radius of arches, cloisters	4	75 ,,	78 ,,
Thickness of front wall East cloisters ...	5	94 ,,	92 ,,
,, inner wall cloisters ...	5	94 ,,	87 ,,
Total breadth of East cloisters ...	27	506 ,,	511 ,,
Great circle of composition of plan of Masjid ...	66	1237½,,	1236 ,,
Main circle of Masjid wings ...	50	937½,,	930 ,,
Small ,, of Cloisters	33	619 ,,	618 ,,
Great circle of Elevation of Masjid proper back of vault	36	675 ,,	680 ,,
Small circle ditto	18	337½,,	340 ,,
Masjid proper inner or main facade great circle	55	1031 ,,	1032 ,,
Main circle of Masjid proper wings ...	21	394 ,,	387 ,,
Small ,, cloisters ...	18	337½,,	340 ,,

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149 CHOGDA, BENGAL INDI

the 17th Janua 1889

To His Excellency the Most Noble
The Marquis of Lansdowne

May it please your Excellency!

The following pages contain my report on the Archœology of Bengal for the year 1887.

The preliminary portion of it shews the lines on which it has been drawn up, and the object I had in departing from the procedure hitherto followed in drawing up these reports.

As I have a few copies printed for my private use, I take the liberty to submit one to you with my respects ~~for your kind perusal.~~ on this the Christmas eve of my Church in accordance with a well known eastern Custom permi enjoins Servants Such a festiva this to respec tender token of their & loya to the Maste

~~You will perceive that parts I and II are wholly independent of each other.~~

~~I intend to use the conclusions arrived at in this report in my future ones, and it is therefore of great importance to me that I should possess the opinion of the learned world on their correctness.~~

~~It will be a service to the cause of Indian Archœology and an obligation conferred on me if you will favor me with your opinion, and with any hints, by following which, I may be able to make my reports more complete in future, and avoid any errors that may have crept into this.~~

~~For obvious reasons, I am unable to accompany this pamphet with the plates. I however annex one plate without which Part II of the report would be wholly unintelligible.~~

I beg to remain, Most Noble Marqu

Your Excellency most obedi

Servant & Subject

Jos. D. Melik Beglar.

CSL

THE ADINA MASJID
AT
HAZRAT PANDUA
DISTRICT MALDA

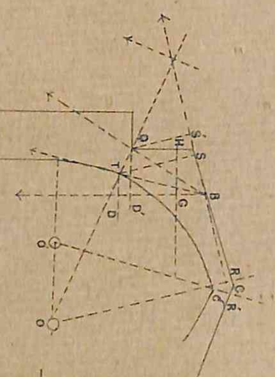
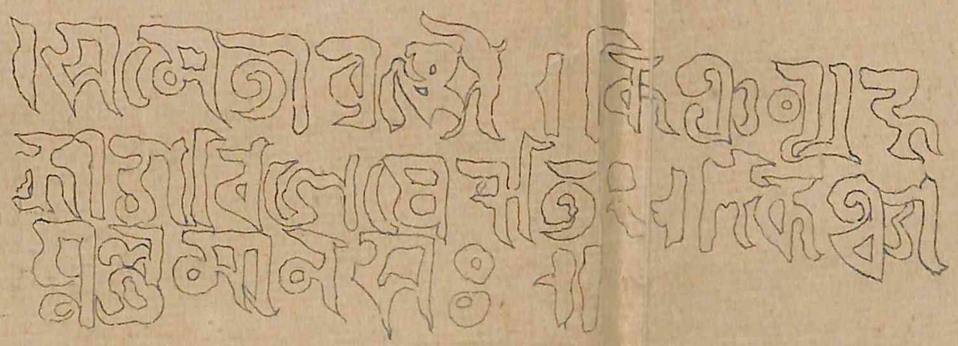
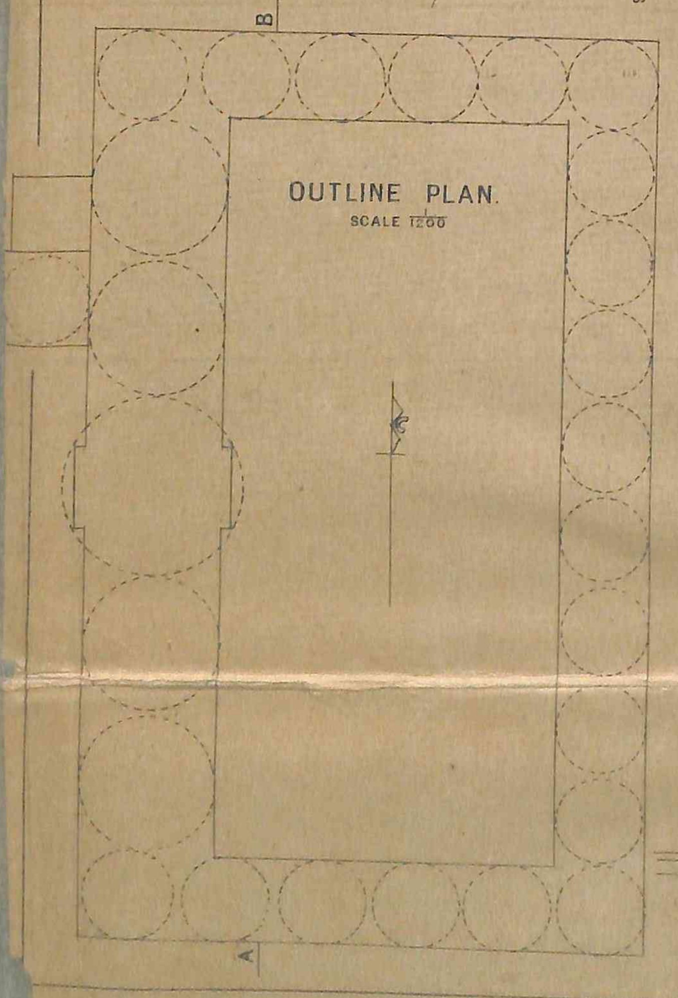


DIAGRAM OF FORCES
IN GREAT VAULT
Fig. 6.
SCALE 1/300TH

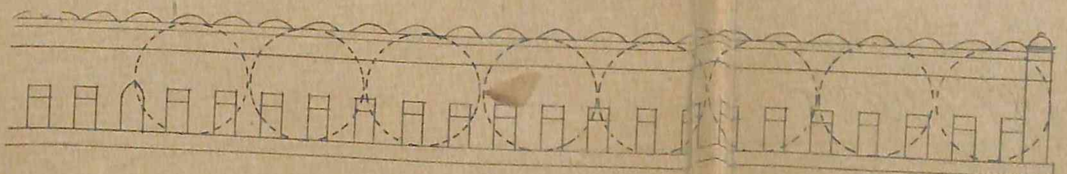
INSCRIPTION FOUND IN THE RUINS.

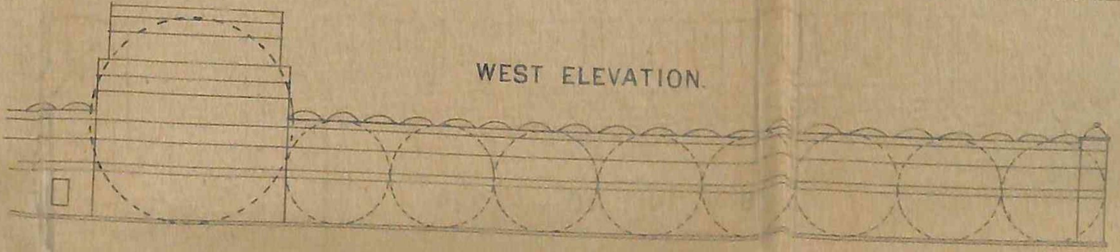




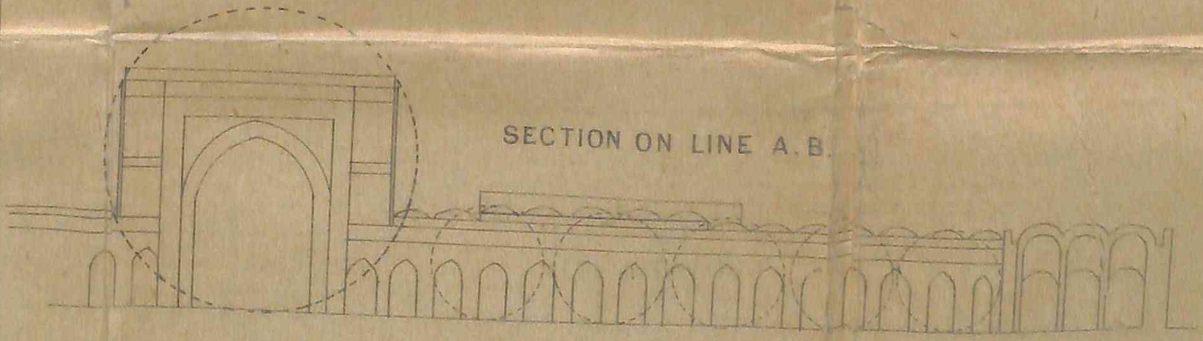
OUTLINE PLAN.
SCALE 1/1200

EAST ELEVATION. SCALE 1/500TH





WEST ELEVATION.



SECTION ON LINE A. B.

Lith: by S. P. Mukerji, Student Govt. School of Art, Calcutta.

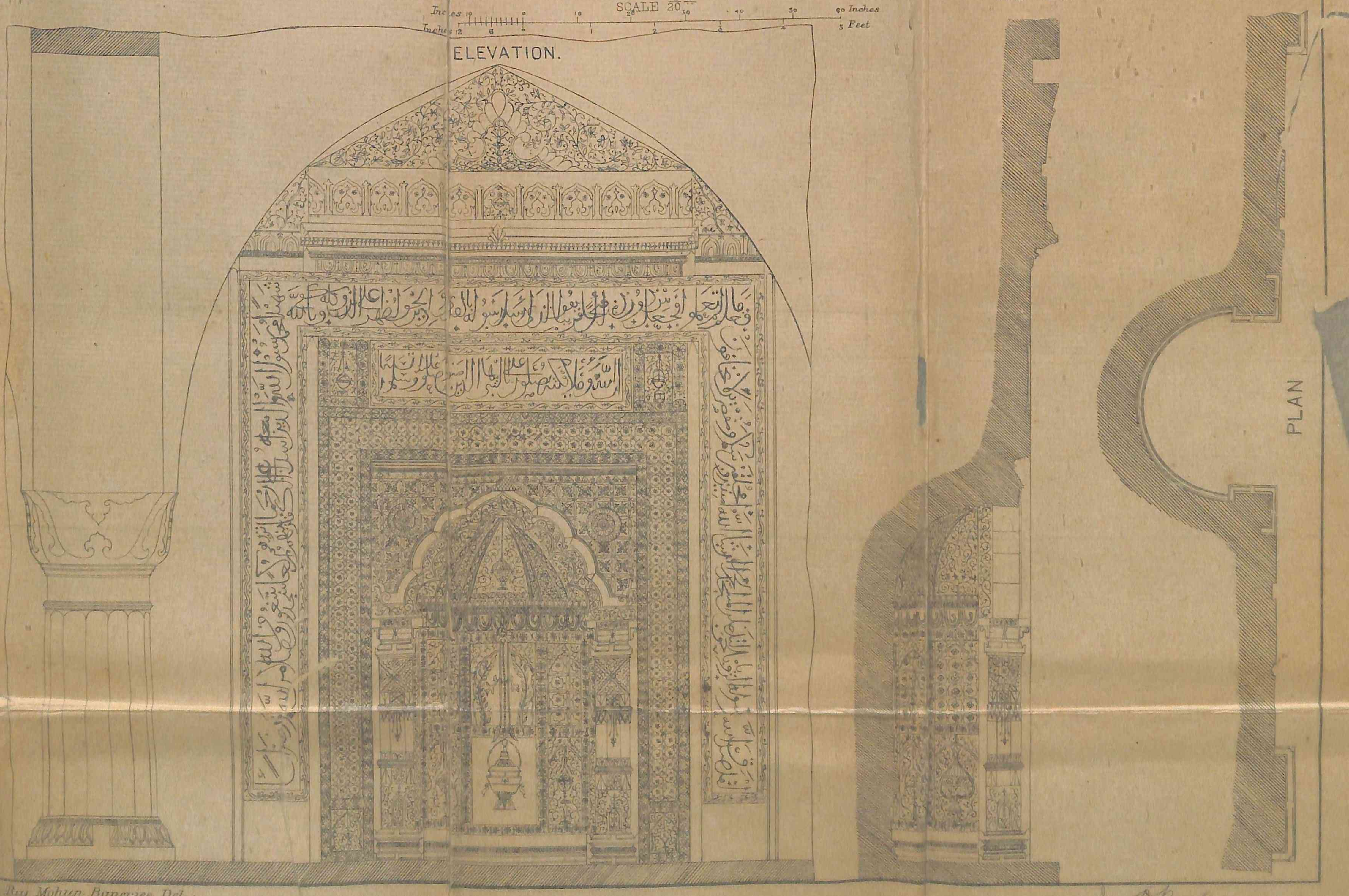
Jos. D. Beglar C.E.
Archaeological Surveyor
Bengal.

GSL

ADINA MASJID.

Plate 18

DETAILS OF UPPER NICHE ON LINE F.G. See Plate 1.



Ray Mohun Banerjee, Del.

Lith. by Kali Dhan Chandra, Student Govt. School of Art

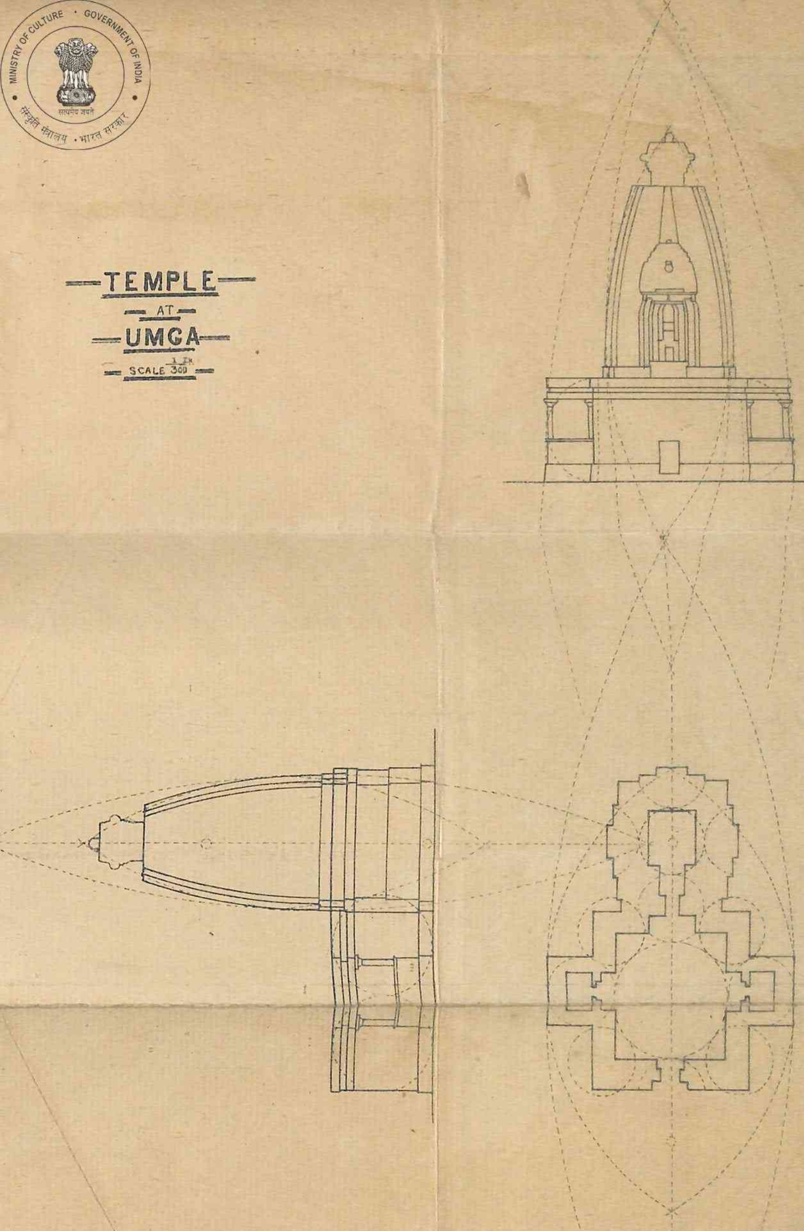
Jno D. Beglar C.E.
Archaeological Surveyor
Bengal.

TEMPLE

AT

UMGA

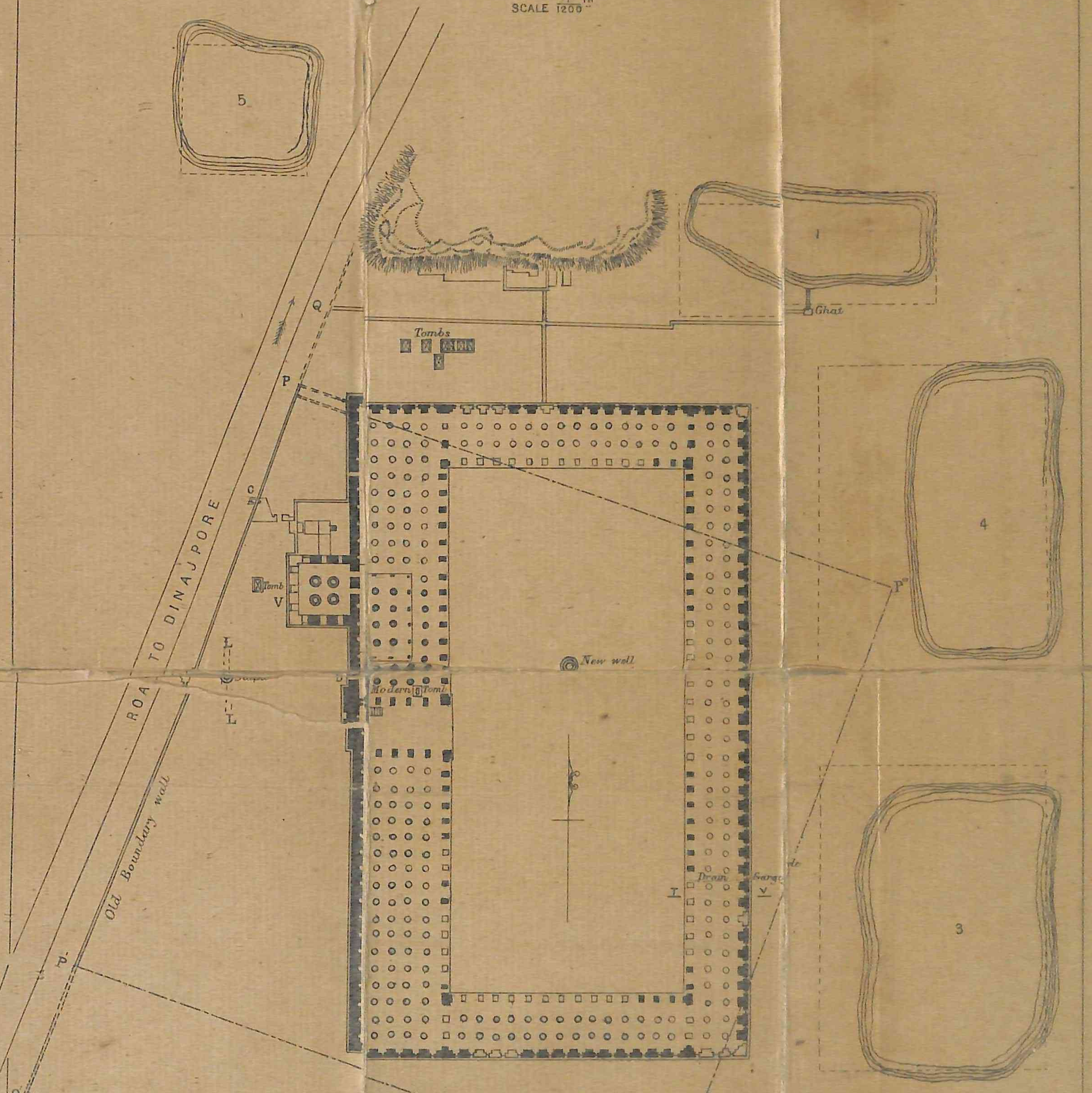
SCALE $\frac{1\text{ In}}{300}$



(Sd.) J.D. Beglar C.E.
Archaeological Surveyor
Bengal Circle

ADINA MASJID Index Plate

THE
ADINA MASJID
AT
HAZRAT PANDUA
DISTRICT MALDA
PLAN
SCALE $\frac{1}{1200}$TH



Raj Mohun Banerjee del. Lith: K. D. Chander, Student Govt. School of Art, Calcutta

Jos D Beglar C.E.
Archaeological Surveyor
Bengal